

TEMPERATURE MODELING OF SULLIVAN CREEK

1. INTRODUCTION

This report updates and replaces the stream temperature modeling analysis presented in the Sullivan Creek Hydroelectric Project Application for Amendment of License. Agency comments on the license application requested additional temperature modeling. The modeling reported in the license application relied upon synthesized climate data since monitoring instruments for project studies were vandalized. Subsequent to submission of the license application, the Public Utility District No. 1 of Pend Oreille County (District) has continued to monitor temperatures in Sullivan Creek. The agencies requested that modeling be done based upon the additional available monitoring data to determine changes in water temperatures from existing flow regimes to recommended flows. Concerns on water temperature relate to potential exceedence of state water quality standards and temperature tolerance ranges for rearing salmonids, particularly bull trout juvenile and fry. Delays in bull trout spawning due to high water temperatures were stated by the agencies to be a concern. The agencies also commented that reduced water temperatures in the winter could increase incubation periods for bull, brown and brook trout. Effects of ice formation have also been expressed as a concern.

This updated analysis incorporates additional water and air temperature data collected for the project area. Summer temperatures and stream temperatures prior to the onset of autumn salmonid spawning are addressed.

Winter water temperature issues were discussed in the draft license application. Monitoring for anchor ice formation is recommended during initial operation of project in the months of December and January. Monitoring would not be necessary if surface ice covers more than 90% of the stream. Monitoring can be accomplished by either visual inspection or remote instrument detection. It is important to distinguish that the presence of anchor ice would not necessarily demonstrate a cause and effect relationship to project operation. The potential for anchor ice formation naturally exists. A monitoring program would need to identify several locations where conditions are favorable for anchor ice formation; then document if reduced flow levels correlate with either the duration or extent of anchor ice formation. The specific location of anchor ice formation would also need to coincide with suitable winter fish habitat for an impact to be possible.

1.1 Background

Stream temperature is an important environmental variable affecting fish and other aquatic life. Both the physiology and activity of salmonids are partially a function of water temperature. Extremely high temperatures can be lethal to salmonids. Other recent findings suggest that alterations to tissue and blood chemistry may occur in association with prolonged exposure to elevated temperatures (Thomas et al. 1986). Time of spawning depends on water temperature as well as other variables (Hickman and Raleigh 1982) with preferred water temperatures during spawning for several trout species being between 43 - 63°F (Reiser & Bjornn 1979). Incubation and emergence timing are also temperature dependent. Aho (1977 thesis, quoted in Nicholas 1978) found fry emerging earlier in an unshaded section of Mack Creek (tributary to McKenzie River, Oregon) than in a shaded section, probably due to warmer water temperatures in the unshaded section.

Stream temperature also affects water quality (particularly dissolved oxygen) and possibly productivity of primary trophic levels. Studies have shown contrasting results in algal and periphyton production with changes in stream temperature (Bisson and Davis 1976; Stockner and Shortreed 1978). While temperature may affect productivity, the extent and direction of that effect varies widely dependent upon the community type, nutrient availability, and sunlight.

Physical Factors Influencing Temperature

Stream temperature has been widely studied and the physics of heat transfer is one of the better understood processes in natural watershed management. Changes in water temperature regimes in streams can arise from climatic changes or from human activities. Stream temperature is best thought of as an energy balance. A stream's temperature is constantly adjusting to maintain an equilibrium with its surrounding environment. Six primary heat transfer processes occur simultaneously, some of which add heat energy to the stream while others dissipate heat (TVA 1972, Brown 1969, Theurer 1984, Adams 1988). The net heat flux determines the stream's temperature. Once a stream achieves this equilibrium temperature regime (typically occurring within a stream reach length of 2,000 feet or less for most streams), it will continue to follow the same daily temperature pattern until the channel or climatic variables affecting the heat transfer processes change. While there are many specific climatic and stream variables accounted for in the stream heat energy balance, a sensitivity analysis of stream heating processes performed by Adams and Sullivan (1989) showed that four primary environmental variables regulate heat input and output and thereby determine stream temperature. These are riparian canopy, stream depth, local air temperature, and groundwater inflow.

Stream depth is the only one of these variables to be significantly affected by the project's operation. Unlike the other variables which affect the magnitude of temperature, depth alters the rate of temperature change but not the final equilibrium temperature regime. In other words, shallow streams heat up and cool on a daily basis faster than deeper streams. However, maximum and minimum equilibrium temperatures generally remain the same.

2.0 METHODS

2.1 Monitoring

Unidata™ multiple channel continuous recording thermographs are being used to monitor water and air temperatures in Sullivan Creek. Monitoring was initiated in May 1993 at the powerhouse and in February 1993 just downstream of Mill Pond. Calibration of the instruments and probes was done for the range 0°F - 90°F prior to their deployment. An additional calibrated air probe was added to instrumentation for monitoring sub-freezing air temperatures. The water probes have been anchored in the main channel flow near but not in contact with the stream bed. The probes have been positioned so as not to be dewatered at low flow. The air probes are located as near the stream as practicable but raised to an elevation to avoid burial by snowpack.

The thermographs are programmed to read the temperature every 10 seconds; recording an average hourly value to the nearest 0.1°F. Unfortunately, substantial gaps occurred in the early part of the

record due to chronic vandalism and occasional instrument malfunction. Complete hourly temperature data were recorded during 1994 with minimal data gaps.

2.2 Temperature Modeling

The model TEMPEST, developed in Washington by Dr. K. Sullivan and Dr. Terry Adams was used for modeling. This model was initially developed to analyze forest practices effects on stream temperature and has been tested in 92 streams in the Pacific Northwest with exceptionally good results. Documentation on the model can be found in Adams and Sullivan (1989) and Sullivan, et al. (1990).

2.2.1 Selection of Model Input Values

The data requirements and the source of data used in this analysis are shown in Table 1.

**TABLE 1
DATA REQUIREMENTS FOR TEMPEST MODEL**

VARIABLE	DATA SOURCE
Hourly Air Temperatures	Synthesized from nearby NOAA data
Solar Radiation	USFWS SRSOLAR Model
Cloud Factor	Assumed zero
Riparian Shade	On site data collection
Wind Speed	Estimated
Relative Humidity	NOAA data adjusted to local air temperature and modified as appropriate for ambient conditions
Stream Depth	IFIM data
Groundwater Inflow Rate	Synthesized stream flow record
Groundwater Temperature	Regional data
Initial Water Temperatures	On site data collection

The TEMPEST model requires data on several climatic variables. Wind speed and relative humidity data are only available regionally for the National Oceanographic and Atmospheric Administration (NOAA) climate station located in Spokane. Regional NOAA data for relative humidity was reviewed as an initial point to begin calibration. Adjustment for local project area air temperatures and ambient conditions are necessary to reflect relative humidity for a forested stream environment. The TEMPEST model was revised to allow independent, user specified relative humidity values for daytime (7 am - 6 pm) and nighttime (7pm - 6 am). The daytime relative humidity specified by the user is the estimated relative humidity at 1 pm. The model adjusts the hourly relative humidity to compensate for hourly air temperature changes when making heat exchange calculations. The model

was also revised to allow the user to independently specify daytime and nighttime average wind speeds. During model calibration, wind speed was adjusted within a reasonable range based on anecdotal observations and regional hourly data.

Sullivan and others (1990) report model sensitivities for the TEMPEST model. Predicted water temperatures are most sensitive to air temperature profiles followed by relative humidity. Both air temperature and relative humidity are positively correlated to summer water temperature. Solar insolation affects maximum water temperature predictions for medium sized streams such as Sullivan Creek but minimum daily water temperature predictions are insensitive to solar insolation. Model sensitivity to starting water temperature (the midnight temperature on the initial day of modeling) was minimized by modeling multiple days. Maximum daily temperature predictions are only weakly sensitive to groundwater accretion rates. Riparian canopy closure affects predictions of maximum and minimum water temperature more than the mean daily temperature. Stream depth is a less sensitive input parameter than air temperature, relative humidity and solar insolation but influences model predictions more than shade input values. Based on prediction of diurnal temperature fluctuation, the TEMPEST model was considered much more sensitive to user provided stream depth data than the USFWS stream temperature model SSTEMP (Sullivan et al. 1990).

Several assumptions are necessary for modeling stream temperatures. It is assumed that stream temperature is a site specific phenomena controlled by localized environmental variables and does not function in a cumulative manner. Equilibrium temperature regimes are assumed to be established within a 2,000 foot stream reach, i.e. the water temperature is in equilibrium with the surrounding environmental conditions. Previous studies (Adams and Sullivan 1989, Sullivan and others 1990, Caldwell and others 1991) support the validity of this assumption.

A third assumption is that IFIM data sufficiently describes the relationship between stream flow and average depth for specified habitat types. Stream discharge was assumed constant for any single day period. Stream discharge data for the dates used in model calibration were available from the USGS gaging station near the powerhouse. Streamflow measurements done by CES confirmed stage rating curves for the powerhouse gaging station.

Model predictive results are best viewed with an understanding of the model's accuracy. In a test of 91 sites located throughout Washington State the average error in prediction of daily maximum stream temperatures between July 15 and August 15 by the TEMPEST model was 1.5°C (2.7°F). Error is likely primarily a function of estimating climatic variables such as relative humidity.

Modeling consisted of:

- identification of critical modeling periods,
- field data collection on relevant channel characteristics,
- compilation of published data,
- model calibration,
- predicting temperatures without the project,
- predicting temperatures with the project, and
- comparing pre-project and project stream temperatures.

Any potential difference in stream temperature due to project operation is more apt to occur during seasons when climatic conditions most strongly affect maximum and minimum stream temperatures. Previous investigations on other streams have identified the period of July 15 through August 15 as being the time when streams are most likely to experience their highest temperatures (Sullivan, et. al. 1990). Subsequently, stream temperature modeling focussed on this period.

Three stream reaches were selected for modeling. Thermograph data have been collected for two of these reaches; 1,000 feet upstream of the powerhouse and 2,000 feet downstream of the Mill Pond outlet. (Note: Actual thermograph location was less than 500 ft. downstream of Mill Pond. Channel characteristics used in modeling are representative of the channel downstream of this thermograph.) The third modeling stream reach is characterized by IFIM transect 4 of study site 2; a wide riffle area whose shallowness makes it susceptible to temperature impacts. Sullivan Creek downstream of Mill Pond is characterized by riffles and runs with few pools. The stream passes through a steep sided canyon upstream of the powerhouse. Numerous pools occur in this lower section. Within each modeling reach riparian shade was measured from the center of the wetted channel at 100 foot intervals using a densiometer. Riparian shade level is 65% for both the stream reaches where thermograph data are available; below Mill Pond and upstream of the powerhouse. The canopy is more open at study site 2 transect 4.

Accretion was estimated for the calibration reach by calculating the difference in synthesized daily stream flows between the Mill Pond and Metaline Falls (powerhouse). Mean monthly flow at Mill Pond for the summer modeling period has been estimated at 75 cfs with a corresponding flow of 79 cfs at the powerhouse. The groundwater temperature (44.6°F) used in modeling is based on the average annual air temperature (available from the NOAA long term record 1965 to present for Boundary Dam station no. 4500844).

The IFIM hydraulic model was used to calculate stream depths within the diversion at different flow regimes modeled. A weighted mean for average stream depths at each transect was calculated for each stream flow modeled. Transect weighting was according to habitat frequency. The stream depths used in temperature modeling are reported in Table 2.

TABLE 2
SUMMARY OF STREAM DEPTHS

Instream flow diversion/powerhouse	Depth (feet)		
	75/79 cfs	50/59 cfs	25/29 cfs
Below Mill Pond: transects 8, 9	1.31	1.11	0.81
Above powerhouse: transects 1,2,3,6	2.50	2.16	1.65
IFIM SS2 transect 4: wide riffle	0.93	0.79	0.64

2.2.2 Model Calibration

Hourly recorded water temperature data were used to calibrate the TEMPEST model by comparing predicted to actual water temperatures. The day with the hottest instantaneous water temperature was identified excluding days with only partial records. The hourly air temperature profile for this day was used in model calibration. Other model input values were selected as described above. Wind speed, relative humidity and solar insolation values were adjusted during calibration so that predicted daily maximum and minimum water temperatures were within 0.2°C of recorded water temperatures. Incremental hourly changes in water temperature for predicted and actual were also compared to confirm that the pattern of incremental change was approximately similar.

2.2.3 Winter Stream Temperature

Winter temperatures were not modeled due to limitations of existing models to realistically predict water temperatures in the appropriate range. Neither validation of the TEMPEST model nor published validation of other models for winter stream conditions in Washington are known to be available. Calibration of the model for winter conditions is also difficult due to more widely varying daily climate and stream flow conditions. Project effects on winter stream temperature were discussed in the initial draft of the license application.

3.0 Results

3.1 Monitoring

Monthly summary statistics and hourly air and water temperature data collected in 1993 through June, 1995, are reported in Appendix A of this report. More recent temperature data have not yet been processed.

Maximum daily air temperatures during July through August 1994 (the modeling period used in this analysis) were significantly above normal based on a 25 year record at the nearby Boundary Dam NOAA climate station (No. 450844). The mean of the monthly average of the daily maximum air temperature (1965-1963) for the nearby NOAA station is 79.63°F and 81.6°F for July and August, respectively. In 1994 the corresponding temperature statistics were 88.26°F and 86.10°F. July and August 1994 had the second highest maximum air temperatures on record. This allows for a conservative modeling approach when interpreting modeled impacts to normally expected impacts.

The hourly temperature record for the period July 15 through August 15, 1994 was searched for the days with the hottest hourly water temperatures. Two days (July 25 and August 3, 1994) were rejected since hourly records were incomplete due to temporary instrument removal during data downloading. (The hottest recorded water temperature just upstream of the powerhouse on each of these two days, 67.9°F, may be an artifact of electronic error during disconnect and redeployment.). The hottest daily maximum water temperature upstream of the powerhouse for days with a complete record was 67.4°F: recorded on July 23, 24, 26, August 2, 4, 1994. Daily water temperatures at the powerhouse peaked between 3 pm and 5 pm.

A 1994 annual maximum recorded water temperature in Sullivan Creek downstream of Mill Pond was recorded on July 25, 1994. The hourly temperature data for the upper monitoring site (downstream of Mill Pond) showed an unusual pattern in hourly temperature data. Values for the model calibration date of July 24, 1994 are shown in Figure 1. Summer daily maximum water temperatures downstream of Mill Pond were not reached until 9 PM to midnight; several hours later than the peak in daily air temperatures and the peak in water temperature at the powerhouse. Summer stream temperatures for our region typically occur in mid to late afternoon as typified by the pattern observed at the powerhouse. The upper monitoring site daily maximum temperature stayed constant for three hours and then dropped precipitously in the following hour. This pattern in hourly temperature suggests that temperatures in Sullivan Creek at the upper monitoring site (less than 500 feet downstream of Mill Pond Dam) are influenced by Mill Pond water temperatures. Insufficient travel time has occurred for temperature regimes to reach equilibrium with channel conditions. The larger water body of Mill Pond is slower to heat on a daily cycle. Once a maximum temperature is reached it remains constant as the larger mass of Mill Pond can effectively store heat energy. The sharp drop in temperature following the peak suggests that heated surface waters in Mill Pond are drained and replaced by incoming cooler water from Sullivan Creek in approximately three hours during summer low flow periods. Mill Pond is not known to stratify during the summer. Modeling for the stream reach below Mill Pond and the mid-diversion reach at SS2 transect 4 used the measured air temperature profile for July 24, 1995 from the Mill Pond thermograph. Model calibration for other input climate data were the same as that used for modeling the powerhouse site. A correction for relative humidity was applied to compensate for differences in the air temperature profiles for the different sites.

3.2 Model Calibration

The recorded hourly temperature for July 24, 1994 was used to calibrate the TEMPEST model for modeling maximum annual temperatures in Sullivan Creek. The gaged streamflow at the powerhouse was 79 cfs. The input values for the calibrated model are listed in Appendix B. The uncalibrated and calibrated model hourly data are also provided in Appendix B. Table 3 and Figure 2 compare predicted and actual temperature regimes for the calibrated model.

Fig. 1 Measured Temperatures
July 24, 1994

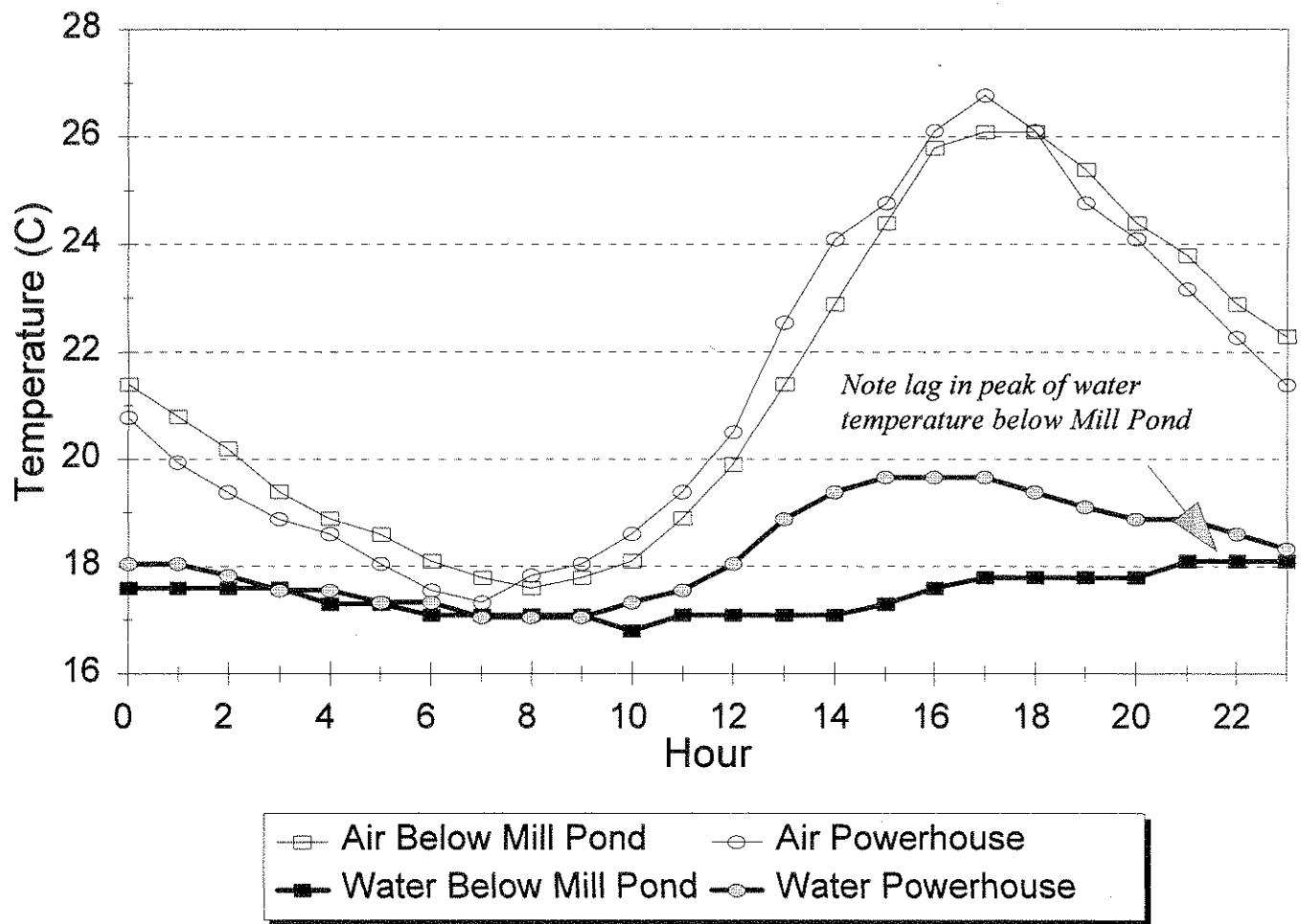


Fig. 2 Tempest Calibration Results

July 24, 1994

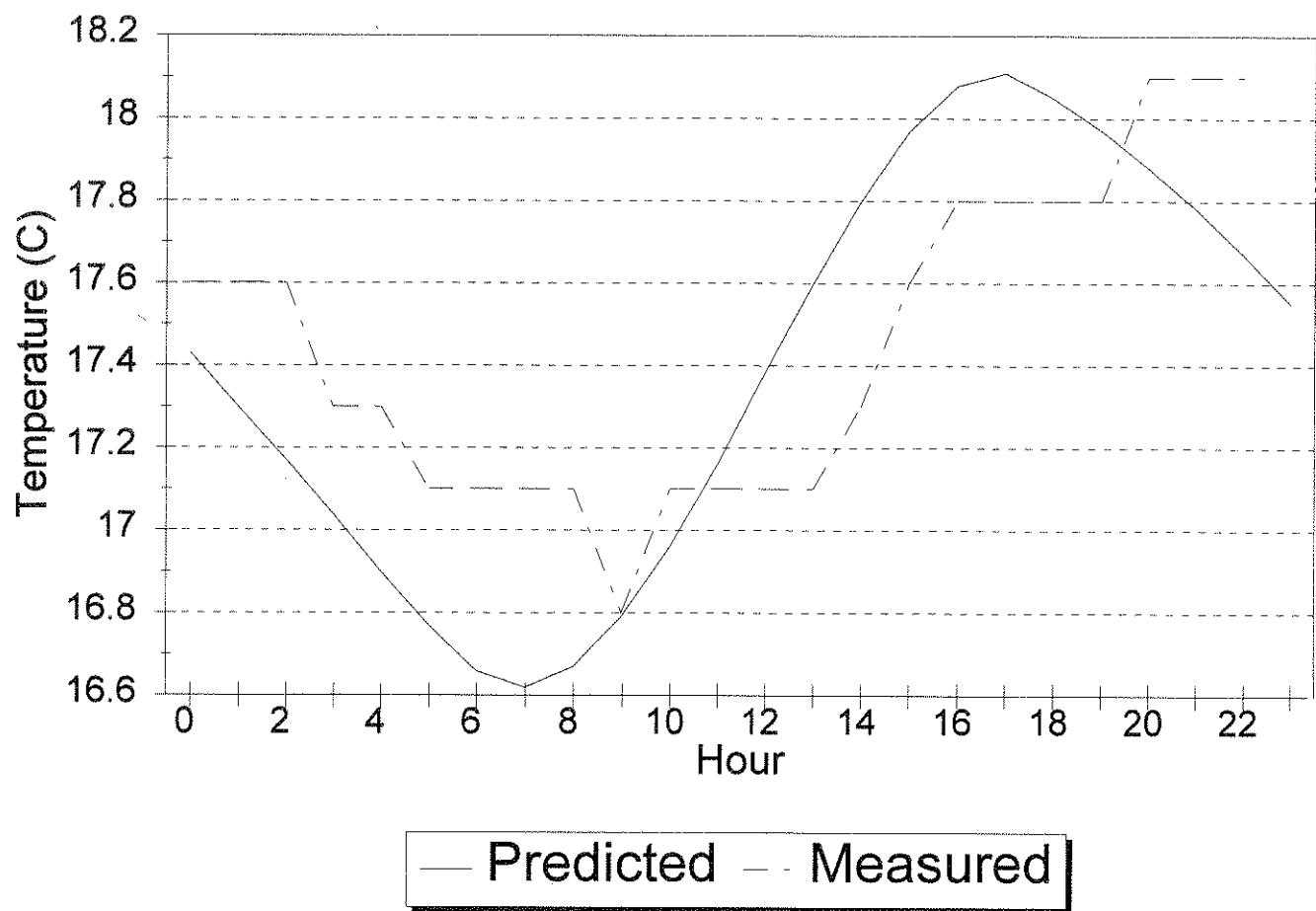


TABLE 3
CALIBRATED MODEL RESULTS

Upstream of Powerhouse Hourly Water Temperature °F				
		Maximum	Minimum	Mean
7/24/94	Predicted	67.3	62.9	65.0
	Measured	67.5	62.8	64.9
	Difference	-0.2	0.1	0.1
7/23/94	Predicted	67.3	62.2	64.7
	Measured	67.5	62.2	64.3
	Difference	-0.2	0	0.4

3.3 Model Results

The calibrated model was used to predict daily water temperature regimes at normal stream flows with and without project operation. Predicted water temperature regimes for the diversion reach during hot summer days are reported in Table 4.

TABLE 4
Predicted Daily Summer Water Temperatures for the Hottest Days.

	Discharge (cfs)	Maximum (°F)	Minimum (°F)	Mean (°F)
Upstream of powerhouse	79	67.3	62.9	65.0
	55	67.6	62.5	65.0
	27	68.3	61.8	65.0
downstream of Mill Pond	75	68.3	60.5	64.4
	50	68.7	60.0	64.4
	25	69.5	59.1	64.3
IFIM SS2 T4 wide riffle	75	69.2	59.4	64.4
most temperature sensitive	50	69.6	59.0	64.3
	25	69.9	58.5	64.2

The potential for point source temperature effects at the powerhouse tailrace was also analyzed. Stream temperatures below the powerhouse could differ from those just above the powerhouse. The temperature component of the WDFW gas saturation model (developed by Mr. Ken Bates) was used

to predict the tailrace temperature. Initial temperature of water entering the buried penstock was set at 62.6°F; the mean daily water temperature at Mill Pond for July 15 - August 15, 1994: modeling period. Using an average ambient ground temperature of 44.6°F the gas saturation model predicts the tailrace water exiting the 16,340 foot buried 90 inch diameter steel pipeline/penstock will be 44.6°F. The predicted maximum stream temperature above the diversion was used. Assuming an instream flow of 55 cfs or 27 cfs upstream at the powerhouse (assume 25 or 50 cfs instream flow + accretion) and a tailrace flow of 50 or 25 cfs the resulting temperature of the downstream mixed water can be calculated using a weighted average.

$$T_3 = \frac{Q_1 * T_1 + Q_2 * T_2}{Q_1 + Q_2}$$

where: Q_1 = instream flow above tailrace = 55 or 27 cfs (instream flow + accretion)

Q_2 = tailrace discharge = 25 or 50 cfs

T_1 = instream temperature above tailrace

T_2 = tailrace water temperature

T_3 = downstream water temperature

The predicted summer daily stream temperatures downstream of the diversion are listed in Table 5.

Table 5. Predicted Stream Temperatures downstream of the Powerhouse.

Instream flow	Maximum	Mean	Minimum
79 cfs	67.3°F	65.0°F	62.9°F
55 cfs	60.4°F	58.6°F	56.9°F
27 cfs	52.9°F	51.8°F	50.6°F

4.0 Conclusions and Mitigation Measures

Sullivan Creek within the diversion reach is a Class AA stream for State water quality standards. The maximum temperature standard for Class AA streams is 16.0°C (60.8°F). When natural conditions exceed 16.0°C, no temperature increases will be allowed due to human activities which will raise the receiving water temperature greater than 0.3°C (0.6°F). Three instream flows were analyzed including the monthly average stream flow (75/79 cfs: below Mill Pond/powerhouse). An instream flow of 50 cfs below Mill Pond (55 cfs at the powerhouse) does not result in a temperature prediction that exceeds water quality standards. An instream flow of 25 cfs below Mill Pond (27 cfs at the powerhouse) does result in a temperature prediction that exceeds the incremental increase criteria for a new activity; i.e., predicted maximum temperature increase of 1.0°F. Predicted minimum daily temperatures are slightly cooler with reduced instream flows. Shallower water cools faster so lower minimum daily summer water temperatures are expected with diversion. Mean daily stream temperatures are essentially unchanged with diversion.

The effect of the return flow at the tailrace will be to cool the downstream waters in the summer and warm the water in the winter. Maximum water temperatures downstream of the tailrace in the summer are predicted to be 60.4°F when the project is operating (at an instream flow of 50 cfs with total stream flow above diversion of 75 cfs) compared to 67.3°F were the project not operating. Return flow from the tailrace in the winter would be at ambient ground temperature which is warmer than the upstream water temperature; the latter being near freezing during cold periods. The temperature effects of the tailrace flow would diminish downstream as the water temperature returns to equilibrium condition. The effect would not extend as far as the mouth of the stream.

REFERENCES

- Adams, T.A. and k. Sullivan. 1988. The Physics of Forest Stream Heating: A Simple Model. Weyerhaeuser Technical Report, Tacoma, Washington.
- Bisson, P.A., and G.E. Davis. 1976. Production of juvenile chinook salmon, Oncorhynchus tshawytscha, in a heated stream. NOAA Fishery Bull. 74:763-774.
- Brown, C.J., W.D. Clothier, and W. Alvord. 1953. Observations on ice conditions in the West Gallatin River, Montana. Proc. Mont. Acad. Sci. 13:21-27.
- Brown, G.W. 1969. Predicting temperatures of small streams. Wat. Resources Res. 5(1):68-75.
- Caldwell, J.E., K. Doughty, and K. Sullivan. 1991. Evaluation of downstream temperature effects of type 4/5 waters. TFW-WQ5-91-004. WA. Dept. Nat. Res., Olympia, WA.
- Campbell, R.F. and J.H. Neuner 1985. Seasonal and diurnal shifts in habitat utilized by resident rainbow trout in Western Washington Cascade mountain streams. In. F.W. Olson, R.G. White, and R.H. Hamre, eds., Symposium on Small Hydropower and Fisheries, May 1985, American Fisheries Society, Bethesda, MD.
- Collings, M.E. 1973. Generalization of Stream-Temperature Data in Washington, USGS Water Supply Paper 2029-B, 45pp.
- Hickman, T., and R.F. Raleigh. 1982. Habitat Suitability Index Models: Cutthroat Trout. U.S. Fish & Wildlife Services, FWS/OBS-82/10.5, February 1982.
- Hungerford, R.D. and R.E. Babbitt. 1987. Overstory removal and residue treatments affect soil surface, air, and soil temperature: implications for seedling survival. Res. Pap. INT-377. Ogden, UT: USDA, Forest Service, Intermountain Forest and Range Experiment Station. 34 p.
- Lutgens, F.K. and E.J. Tarbuck. 1992. The atmosphere, an Introduction to Meteorology. 5th ed. Prentice Hall. New Jersey.
- Needham, P.R. and A. C Jones. 1959. Flow, temperature, solar radiation and ice in relation to activities of fishes in sagehen Creek, California. Ecology: Vol. 40;3.
- Nicholas, J.W., 1978. A review of literature and unpublished information on Cutthroat trout (Salmo clarki clarki) of the Willamette watershed. Oregon Dept of Fish and Wildlife, Fisheries Information Report Series, # 78-1.
- Reiser, D.W. and T.C. Bjornn, 1979. Habitat Requirements of Anadromous Salmonids. U.S.D.A. Pacific Northwest Forest and Range Experiment Station, General Technical Report PNW-96, October 1979.

Satterlund, D.R., R.C. Chapman, and R. D. Beach. 1983. Modeling the daily temperature cycle. Northwest Science: Vol. 57, No. 1.

Stockner, J.G., and K.R.S. Shortreed. 1978. Enhancement of autotrophic production by nutrient addition in a coastal rainforest stream on Vancouver Island. J. Fish. Res. Board Can. 35:28-34.

Sullivan, K., J. Tooley, K. Doughty, J.E. Caldwell, and P. Knudsen, 1990. Evaluation of Prediction Models and Characterization of Stream Temperature Regimes in Washington. Submitted to Timber/Fish/Wildlife, Draft Final Report, 2/13/90.

Sullivan, K., and T. Adams 1990. The TEMPEST Model and the Physics of Stream Heating, submitted to T/F/W, in press.

Sullivan, K. and T.A. Adams, 1988. The Physics of Stream Heating 2): An Analysis of Temperature Patterns in Stream Environments Based on Physical Principles and Field Data. Weyerhaeuser Technical Report.

Tennessee Valley Authority. 1972. Heat and mass transfer between a water surface and the atmosphere. Water Res. Lab. Rep. 14. Norris, TN. 166pp.

Theurer, F.D., K.A. Voos and W.J. Miller. 1984. Instream water temperature model. Instream Flow Info. Paper No. 16. U.S.D.I. Fish and Wildlife Service FWS-OBS-84/15.

Thomas, R.E., J.A. Gharret, M.G. Carls, S.D. Rice, A. Moles, and S. Korn. 1986. Effects of fluctuating temperature on mortality, stress, and energy reserves of juvenile coho salmon. trans. Am. Fish. Soc. 115:52-59.

APPENDIX A
STREAM TEMPERATURE MONITORING DATA

Sullivan Creek Air & Water Temperatures At Mill Pond
Monthly Summaries

Date	Water			Air		
	Min	Avg	Max	Min	Avg	Max
Mar-93	33.6	35.7	38.2	16.8	31.6	40.1
Apr-93	37.9	40.1	43.0	30.6	38.1	44.4
May-93	Data not available					
Jun-93	Data not available					
Jul-93	56.7	57.1	57.5	46.5	52.3	58.8
Aug-93	56.7	57.1	57.5	44.1	55.2	66.9
Sep-93	50.1	53.9	60.5	40.1	50.1	62.2
Oct-93	50.8	52.3	53.5	34.5	45.4	58.8
Nov-93	39.1	43.8	50.4	16.0	31.9	45.4
Dec-93	34.2	37.8	40.1	18.6	30.0	36.6
Jan-94	33.3	34.3	35.1	19.1	30.0	34.6
Feb-94	30.9	33.8	35.7	-0.8	25.7	33.0
Mar-94	35.4	37.1	40.1	22.7	32.9	43.7
Apr-94	38.5	39.9	42.7	33.0	40.4	51.2
May-94	39.5	43.2	48.2	35.7	45.3	56.7
Jun-94	44.7	50.4	57.9	40.7	52.0	69.4
Jul-94	53.9	59.9	66.0	47.5	62.9	79.6
Aug-94	57.5	61.6	65.0	45.4	62.3	81.5
Sep-94	54.7	56.8	60.0	41.4	54.4	70.5
Oct-94	47.5	52.3	55.5	34.8	43.6	54.7
Nov-94	37.2	41.6	47.5	19.1	31.4	38.5
Dec-94	32.7	34.9	38.5	7.3	26.1	35.7
Jan-95	30.6	32.9	34.5	5.2	23.9	31.6
Feb-95	31.8	34.1	35.1	6.7	27.8	35.1
Mar-95	33.6	35.9	39.5	16.9	31.9	45.9
Apr-95	38.5	40.1	43.4	30.6	39.1	53.1
May-95	39.5	42.3	46.1	36.0	45.5	55.9
Jun-95	43.7	50.9	57.1	43.4	51.6	63.5
Jul-95	53.9	58.0	61.8	48.6	59.9	74.3
Aug-95	54.7	57.3	62.2	45.2	56.2	75.5
Sep-95	52.3	56.3	59.2	40.1	54.4	69.0
Oct-95	48.6	49.9	52.3	35.7	43.2	49.5

Sullivan Creek Air & Water Temperatures At Mill Pond

Date	Water			Air		
	Min	Avg	Max	Min	Avg	Max
02-25-93				16.0	20.6	24.4
02-26-93				16.0	18.9	24.9
02-27-93				16.2	22.0	27.7
02-28-93				16.2	22.9	29.5
03-01-93	33.6	33.8	33.9	16.8	24.9	30.9
03-02-93	33.9	34.0	34.2	28.0	29.1	30.3
03-03-93	33.9	34.0	34.2	20.0	27.4	31.8
03-04-93	33.9	34.1	34.2	29.7	31.1	32.1
03-05-93	34.2	34.2	34.5	32.1	32.4	32.7
03-06-93	34.5	34.5	34.5	32.4	32.7	33.3
03-07-93	34.5	34.8	35.1	32.1	33.0	34.8
03-08-93	34.8	35.0	35.4	30.9	32.6	33.9
03-09-93	34.8	35.1	35.4	25.8	30.1	33.6
03-10-93	34.8	35.2	35.4	22.7	28.5	33.9
03-11-93	34.8	35.1	35.4	21.9	27.6	33.0
03-12-93	34.8	35.1	35.1	21.9	27.7	33.0
03-13-93	35.1	35.2	35.4	20.3	27.6	33.9
03-14-93	35.1	35.3	35.4	28.6	31.0	32.7
03-15-93	35.1	35.4	35.7	30.9	32.9	33.9
03-16-93	35.4	35.5	35.7	24.1	29.6	33.0
03-17-93	35.4	35.7	36.0	30.0	31.7	33.3
03-18-93	35.7	36.1	36.3	32.4	33.0	35.4
03-19-93	36.0	36.3	36.6	30.3	32.4	34.5
03-20-93	36.3	36.5	36.6	31.8	32.6	33.3
03-21-93	36.3	36.5	36.9	31.8	32.9	33.9
03-22-93	36.6	36.7	36.9	32.1	33.0	33.9
03-23-93	36.6	36.8	36.9	33.3	34.3	36.0
03-24-93	36.3	36.3	36.6	32.7	33.6	35.4
03-25-93	36.3	36.3	36.3	31.5	33.3	35.1
03-26-93	36.3	36.3	36.6	31.5	33.3	36.0
03-27-93	36.3	36.7	36.9	31.2	33.6	36.9
03-28-93	36.6	37.0	37.2	31.5	34.0	36.9
03-29-93	36.9	37.3	37.6	32.4	34.6	37.9
03-30-93	37.2	37.5	37.9	31.2	33.7	36.6
03-31-93	37.2	37.8	38.2	31.2	35.1	40.1
04-01-93	37.9	38.3	38.8	31.2	35.8	42.1
04-02-93	38.2	38.4	38.8	34.8	36.9	39.5
04-03-93	38.5	38.9	39.1	35.4	37.6	40.7
04-04-93	38.8	39.0	39.5	35.4	37.1	38.8
04-05-93	38.8	39.1	39.5	33.0	35.8	38.2
04-06-93	38.8	39.3	39.5	30.6	35.1	41.7
04-07-93	39.1	39.5	40.1	36.0	38.8	43.7
04-08-93	39.5	39.9	40.1	36.0	39.4	43.4
04-09-93	39.8	40.2	41.1	36.9	39.4	44.4
04-10-93	40.1	40.4	40.4	33.9	37.0	39.8
04-11-93	40.1	40.5	41.7	34.5	37.3	41.4
04-12-93	40.4	40.6	40.7	36.3	37.9	39.8
04-13-93	40.4	40.5	40.7	36.3	38.8	41.4
04-14-93	40.4	41.1	41.7	35.4	38.9	41.7
04-15-93	40.7	40.9	41.1	32.4	37.2	41.1
04-16-93	40.7	41.2	41.7	35.7	40.3	43.4
04-17-93	41.4	41.5	41.7	39.1	41.4	43.4
04-18-93	41.4	41.7	42.1	37.9	40.2	42.1
04-19-93	41.4	41.7	43.0	35.1	39.0	43.7
06-26-93	51.9	53.4	56.3	50.1	54.2	57.5
06-27-93				51.9	54.0	55.1
06-28-93				47.9	50.0	51.6
06-29-93				49.0	50.5	51.9
06-30-93				50.1	51.5	52.7
07-01-93				48.2	51.3	53.5
07-02-93				49.7	51.3	53.1
07-03-93				49.3	51.5	53.5
07-04-93				50.8	52.8	54.3

Sullivan Creek Air & Water Temperatures At Mill Pond

<u>Date</u>	Water			Air		
	<u>Min</u>	<u>Avg</u>	<u>Max</u>	<u>Min</u>	<u>Avg</u>	<u>Max</u>
07-05-93				51.9	53.4	55.1
07-06-93				50.4	52.5	54.7
07-07-93				50.1	52.3	54.3
07-08-93				50.4	53.1	55.5
07-09-93				52.3	53.8	55.1
07-10-93				50.4	52.5	53.9
07-11-93				49.7	52.1	53.1
07-12-93				47.5	49.3	50.8
07-13-93				46.5	49.6	51.9
07-14-93				47.9	50.2	51.9
07-15-93				48.2	50.1	51.9
07-16-93				49.0	50.2	51.2
07-17-93				48.2	49.8	50.8
07-18-93				50.1	51.6	53.5
07-19-93				49.0	51.8	53.9
07-20-93				51.9	52.4	53.1
07-21-93				51.2	51.9	52.3
07-22-93				49.3	51.6	52.7
07-23-93				51.9	53.4	55.1
07-24-93				52.7	54.0	55.5
07-25-93				52.3	53.5	54.7
07-26-93				52.3	54.6	56.7
07-27-93				53.5	55.2	57.1
07-28-93				53.5	56.4	58.8
07-29-93				54.3	55.9	57.5
07-30-93				49.7	52.1	53.9
07-31-93				48.2	52.1	54.7
08-01-93				49.3	53.4	56.3
08-02-93				51.2	55.1	57.9
08-03-93				53.1	56.5	58.8
08-04-93				53.1	56.8	59.6
08-05-93				54.3	57.6	60.0
08-06-93				53.9	57.7	60.5
08-07-93				54.7	57.6	59.2
08-08-93				52.7	56.4	59.2
08-09-93				51.2	55.3	59.2
08-13-93	56.7	57.1	57.5	57.9	60.8	66.9
08-14-93	55.5	56.6	58.3	51.6	56.7	62.2
08-15-93	55.9	56.3	57.5	56.7	57.4	58.8
08-16-93	55.1	55.3	55.9	55.1	56.0	57.1
08-17-93	54.7	54.7	55.1	55.1	55.7	56.7
08-18-93	54.3	55.5	57.1	54.7	57.0	60.5
08-19-93	55.5	57.1	59.6	53.1	57.7	63.2
08-20-93	56.3	57.3	58.3	55.1	58.7	61.4
08-21-93	56.3	57.0	57.9	57.9	58.5	59.2
08-22-93	55.9	56.8	57.9	54.7	57.3	60.0
08-23-93	56.3	56.9	57.5	54.3	57.1	59.6
08-24-93	55.5	56.3	57.5	47.2	50.4	53.1
08-25-93	53.9	54.6	55.1	44.1	49.1	54.7
08-26-93	53.5	54.8	56.3	45.8	51.1	57.5
08-27-93	53.9	54.6	55.9	50.4	52.7	56.3
08-28-93	53.1	53.9	54.7	45.4	49.5	52.3
08-29-93	52.7	53.9	55.5	45.1	49.9	55.5
08-30-93	52.7	54.1	55.5	46.5	51.2	56.3
08-31-93	53.1	54.0	55.5	47.2	51.2	55.1
09-01-93	53.1	54.2	55.5	49.7	53.9	58.3
09-02-93	54.3	55.6	57.1	50.1	54.5	59.6
09-03-93	54.7	56.0	57.9	50.8	55.5	60.5
09-04-93	55.5	56.6	58.3	52.3	56.3	59.6
09-05-93	55.1	56.7	57.9	51.9	55.7	60.0
09-06-93	55.5	56.8	58.3	51.2	55.5	60.5
09-07-93	55.9	57.1	58.8	51.2	55.7	60.5
09-08-93	55.9	57.5	59.2	51.2	56.0	60.9
09-09-93	56.3	57.5	59.2	51.9	56.2	60.9
09-10-93	56.3	58.0	60.5	52.3	56.9	62.2

Sullivan Creek Air & Water Temperatures At Mill Pond

Date	Water			Air		
	Min	Avg	Max	Min	Avg	Max
09-11-93	55.5	56.6	58.3	50.8	53.4	57.5
09-12-93	54.7	55.3	56.3	47.9	50.1	51.9
09-13-93	53.9	54.8	55.5	44.4	48.0	51.6
09-14-93	53.1	53.8	55.1	46.5	48.3	49.7
09-15-93	52.7	53.3	54.3	46.8	48.4	50.1
09-16-93	51.9	52.8	53.5	42.4	46.4	50.8
09-17-93	51.9	52.9	53.9	42.4	46.4	50.1
09-18-93	51.6	52.8	53.9	43.0	47.0	50.8
09-19-93	51.9	52.6	53.5	45.8	48.0	50.8
09-20-93	51.6	52.0	52.7	44.7	46.3	47.5
09-21-93	50.8	51.6	51.9	44.4	46.0	48.6
09-22-93	50.4	51.4	51.9	40.1	44.0	47.9
09-23-93	50.4	51.4	52.3	41.1	44.8	48.2
09-24-93	50.1	51.0	51.9	41.7	45.3	47.9
09-25-93	50.1	50.9	51.6	42.4	45.8	49.0
09-26-93	50.1	51.2	52.7	42.1	45.5	49.0
09-27-93	50.1	51.3	52.7	43.4	47.0	50.4
09-28-93	50.4	51.5	52.7	45.4	48.5	51.6
09-29-93	51.2	52.3	53.9	44.7	48.9	53.1
09-30-93	51.6	52.1	52.7	47.2	49.5	51.9
10-01-93	50.8	51.9	52.7	43.4	48.3	56.3
10-02-93	51.2	52.0	53.1	40.4	47.9	55.9
10-03-93	50.8	51.8	53.1	41.1	49.0	58.8
10-04-93	50.8	52.0	53.1	42.4	49.4	57.1
10-05-93	51.6	52.6	53.5	43.0	50.0	57.9
10-06-93	52.7	53.2	53.5	48.2	51.1	54.7
10-07-93	52.7	52.9	53.5	44.4	46.2	47.9
10-08-93	52.3	53.1	53.5	41.1	45.8	50.8
10-09-93	52.3	53.0	53.5	36.9	42.5	47.9
10-10-93	51.9	52.3	52.7	37.2	43.1	49.3
10-11-93	51.6	52.0	52.3	39.5	44.9	50.8
10-12-93	51.9	52.3	52.7	43.7	47.4	51.2
10-13-93	52.3	52.5	52.7	47.5	49.0	50.4
10-14-93	52.7	53.0	53.5	48.6	49.4	50.4
10-15-93	52.7	52.9	53.1	47.2	48.3	49.3
10-16-93	53.1	53.2	53.5	46.8	48.2	49.3
10-17-93	53.1	53.4	53.5	44.7	46.5	48.6
10-18-93	52.7	52.8	53.1	40.1	44.4	47.2
10-19-93	52.3	52.7	52.7	39.8	44.7	46.8
10-20-93	51.9	52.4	52.7	34.5	39.4	44.4
10-21-93	51.9	52.2	52.7	38.5	42.2	45.8
10-22-93	51.9	52.1	52.3	38.5	43.2	47.5
10-23-93	52.3	52.5	52.7	47.2	48.0	48.6
10-24-93	52.3	52.6	52.7	42.7	46.1	48.6
10-25-93	51.9	52.3	52.7	38.2	42.2	46.5
10-26-93	51.6	51.7	51.9	36.0	40.2	44.4
10-27-93	51.2	51.2	51.6	36.9	40.6	44.7
10-28-93	51.2	51.3	51.6	41.4	44.2	47.2
10-29-93	50.8	51.2	51.2	36.9	41.3	44.7
10-30-93	50.8	50.9	51.2	36.3	40.5	44.4
10-31-93	50.8	50.8	50.8	39.8	43.2	45.8
11-01-93	50.1	50.4	50.4	35.7	39.7	43.0
11-02-93	50.1	50.1	50.4	40.1	42.0	43.7
11-03-93	49.7	49.9	50.1	38.8	41.9	45.4
11-04-93	49.3	49.4	49.7	36.3	39.7	42.7
11-05-93	48.2	48.6	49.0	31.8	35.4	39.1
11-06-93	46.8	47.6	48.2	33.0	34.6	36.6
11-07-93	45.8	46.4	46.8	33.3	34.8	36.9
11-08-93	45.4	45.6	45.8	33.3	34.8	37.2
11-09-93	45.8	45.8	46.1	30.6	33.7	36.6
11-10-93	45.8	46.0	46.1	31.5	34.5	37.9
11-11-93	45.8	45.8	45.8	30.3	33.2	36.6
11-12-93	45.1	45.4	45.8	29.5	32.8	36.6
11-13-93	43.7	44.5	44.7	30.9	33.0	35.7
11-14-93	42.7	43.1	43.7	25.2	29.2	31.5

Sullivan Creek Air & Water Temperatures At Mill Pond

<u>Date</u>	Water			Air		
	<u>Min</u>	<u>Avg</u>	<u>Max</u>	<u>Min</u>	<u>Avg</u>	<u>Max</u>
11-15-93	42.1	42.4	42.7	31.2	32.8	34.8
11-16-93	41.4	41.6	42.1	28.6	31.7	33.9
11-17-93	40.7	41.2	41.7	31.2	33.0	34.8
11-18-93	41.7	42.3	42.7	31.8	34.0	36.0
11-19-93	42.4	42.6	43.0	29.7	32.7	35.1
11-20-93	42.7	42.7	43.0	33.0	34.1	34.8
11-21-93	42.7	42.8	43.0	34.5	35.6	36.6
11-22-93	41.7	42.2	42.7	21.6	28.2	36.0
11-23-93	40.1	40.8	41.7	16.0	17.6	21.1
11-24-93	39.5	39.8	40.1	16.0	17.3	20.5
11-25-93	39.5	39.5	39.5	16.0	17.6	21.3
11-26-93	39.1	39.5	39.5	16.0	19.3	23.5
11-27-93	39.5	39.5	39.5	21.6	25.8	29.2
11-28-93	39.5	39.6	39.8	29.2	30.9	32.1
11-29-93	39.5	39.7	39.8	32.4	33.5	34.8
11-30-93	39.8	39.8	39.8	33.6	34.5	35.1
12-01-93	39.8	39.8	39.8	33.6	34.6	35.1
12-02-93	39.5	39.7	39.8	34.5	34.8	35.1
12-03-93	39.5	39.8	39.8	34.8	35.1	35.4
12-04-93	39.8	39.8	40.1	33.0	35.4	36.6
12-05-93	39.1	39.5	39.8	24.9	29.6	32.4
12-06-93	38.8	39.1	39.1	21.1	24.6	28.0
12-07-93	38.8	39.0	39.1	28.0	29.3	31.2
12-08-93	38.8	38.8	39.1	30.9	32.3	34.2
12-09-93	38.8	39.0	39.1	33.9	34.5	35.1
12-10-93	39.1	39.3	39.5	34.8	35.4	36.0
12-11-93	39.5	39.5	39.5	35.4	35.7	36.3
12-12-93	39.1	39.5	39.5	32.4	34.9	36.0
12-13-93	39.1	39.1	39.5	31.8	33.0	33.9
12-14-93	39.1	39.1	39.1	33.9	34.3	34.8
12-15-93	39.1	39.1	39.1	31.8	33.5	34.8
12-16-93	38.5	38.7	39.1	24.9	28.0	32.1
12-17-93	38.5	38.5	38.5	22.7	26.3	28.9
12-18-93	38.5	38.5	38.5	27.7	28.4	29.2
12-19-93	38.5	38.5	38.5	28.6	29.4	30.0
12-20-93	38.5	38.5	38.5	29.5	30.3	31.2
12-21-93	38.2	38.5	38.5	28.6	29.5	30.6
12-22-93	36.0	37.5	38.5	25.8	28.4	30.6
12-23-93	35.4	35.7	36.0	24.3	25.8	27.8
12-24-93	35.4	35.5	35.7	23.1	25.8	27.8
12-25-93	34.8	35.2	35.4	18.6	22.0	25.6
12-26-93	35.1	35.3	35.4	21.6	24.0	26.5
12-27-93	35.1	35.3	35.4	20.3	24.2	27.3
12-28-93	34.8	34.8	35.1	22.7	24.4	26.5
12-29-93	34.5	34.8	34.8	23.3	26.3	29.2
12-30-93	34.8	34.9	35.1	27.7	29.3	31.1
12-31-93	34.5	34.8	34.8	29.7	30.4	31.1
01-01-94	34.2	34.5	34.5	29.7	30.7	31.6
01-02-94	34.2	34.3	34.5	30.9	31.5	32.0
01-03-94	34.2	34.3	34.5	31.2	31.8	32.5
01-04-94	34.2	34.2	34.2	31.5	31.9	33.0
01-05-94	34.2	34.2	34.2	29.2	31.6	32.5
01-06-94	33.3	33.8	34.2	23.1	25.8	28.9
01-07-94	33.3	33.6	33.6	24.6	27.7	30.6
01-08-94	33.6	33.7	33.9	29.2	30.1	31.1
01-09-94	33.9	33.9	33.9	30.3	31.0	32.0
01-10-94	33.9	33.9	33.9	29.5	30.8	32.0
01-11-94	33.9	33.9	34.2	30.9	31.6	32.5
01-12-94	34.2	34.2	34.2	31.5	32.1	33.0
01-13-94	34.2	34.4	34.5	31.8	32.4	33.0
01-14-94	34.5	34.5	34.5	32.4	32.9	33.6
01-15-94	34.8	34.8	34.8	31.5	32.8	34.6
01-16-94	34.8	34.8	34.8	30.3	31.8	33.6
01-17-94	34.8	34.8	34.8	30.3	31.8	33.0
01-18-94	34.8	34.8	34.8	30.9	31.7	33.0

Sullivan Creek Air & Water Temperatures At Mill Pond

Date	Water			Air		
	Min	Avg	Max	Min	Avg	Max
01-19-94	34.5	34.7	34.8	26.9	30.0	31.6
01-20-94	33.6	34.1	34.5	22.3	25.7	29.2
01-21-94	33.6	33.9	34.2	22.7	26.1	30.1
01-22-94	33.9	34.1	34.5	27.7	30.0	31.6
01-23-94	34.2	34.4	34.5	29.5	30.7	32.0
01-24-94	34.5	34.6	34.8	30.9	31.7	33.0
01-25-94	34.5	34.8	34.8	29.5	30.8	32.0
01-26-94	34.8	34.8	35.1	30.9	31.8	32.5
01-27-94	34.8	35.0	35.1	27.3	31.2	33.0
01-28-94	34.2	34.5	34.8	22.3	26.7	31.1
01-29-94	34.2	34.4	34.5	25.5	28.4	30.1
01-30-94	33.9	34.1	34.5	22.7	25.4	28.7
01-31-94	33.6	33.9	34.2	19.1	23.2	28.2
02-01-94	33.3	33.7	33.9	18.8	23.0	26.9
02-02-94	33.3	33.6	33.9	17.7	22.5	24.7
02-03-94	32.4	33.1	33.6	13.1	19.5	24.3
02-04-94	33.3	33.5	33.6	21.9	23.5	25.6
02-05-94	33.3	33.3	33.6	23.3	24.3	26.0
02-06-94	33.0	33.2	33.3	22.7	24.0	26.0
02-07-94	32.1	32.6	33.0	6.1	18.3	23.5
02-08-94	30.9	31.6	32.1	-0.8	12.1	16.9
02-09-94	32.1	32.1	32.4	14.1	16.7	19.9
02-10-94	32.1	32.3	32.4	12.7	19.2	25.2
02-11-94	32.1	32.3	32.4	17.8	20.7	24.3
02-12-94	32.4	32.5	32.7	22.2	24.9	27.8
02-13-94	32.7	32.9	33.0	26.6	29.2	31.1
02-14-94	32.7	32.9	33.0	25.2	28.4	30.6
02-15-94	33.0	33.0	33.0	28.0	29.7	31.1
02-16-94	33.0	33.1	33.3	30.0	30.6	31.6
02-17-94	35.1	35.2	35.4	31.8	32.2	32.4
02-18-94	35.4	35.4	35.4	31.8	32.3	33.0
02-19-94	35.1	35.3	35.4	30.0	31.1	31.8
02-20-94	35.1	35.2	35.4	29.5	30.8	31.8
02-21-94	35.1	35.3	35.4	31.8	31.9	32.1
02-22-94	35.4	35.4	35.4	29.5	31.0	31.8
02-23-94	35.1	35.4	35.7	23.5	30.5	32.1
02-24-94	34.5	34.9	35.1	16.2	20.3	23.8
02-25-94	34.5	34.7	34.8	20.3	22.9	25.8
02-26-94	34.5	34.9	35.1	25.5	27.8	30.0
02-27-94	34.8	35.1	35.4	30.0	30.9	31.5
02-28-94	35.1	35.3	35.4	31.5	31.6	31.8
03-01-94	35.4	35.6	35.7	31.8	32.4	33.3
03-02-94	35.7	35.7	35.7	32.1	33.0	34.2
03-03-94	35.7	35.8	36.0	32.4	33.2	34.2
03-04-94	36.0	36.0	36.3	31.8	33.9	36.3
03-05-94	36.0	36.1	36.3	28.3	30.7	32.1
03-06-94	35.7	36.0	36.3	23.0	27.5	31.5
03-07-94	35.7	35.8	36.3	23.0	27.4	31.2
03-08-94	35.4	35.7	36.0	22.7	27.7	31.5
03-09-94	35.4	35.7	36.0	25.2	29.4	32.7
03-10-94	36.0	36.0	36.0	30.6	32.1	33.9
03-11-94	36.0	36.3	36.3	32.1	32.9	34.8
03-12-94	36.3	36.6	36.9	30.6	32.6	35.1
03-13-94	36.6	36.8	36.9	33.0	33.9	35.7
03-14-94	36.9	37.0	37.2	33.0	34.8	37.2
03-15-94	36.9	37.4	37.9	31.5	34.9	39.1
03-16-94	37.6	37.7	37.9	33.6	35.9	39.1
03-17-94	37.6	37.9	37.9	35.1	35.7	36.9
03-18-94	37.9	37.9	37.9	34.8	35.6	37.2
03-19-94	37.6	37.8	37.9	31.2	32.7	34.2
03-20-94	37.2	37.4	37.6	28.9	31.1	32.4
03-21-94	37.2	37.3	37.6	31.2	32.8	33.6
03-22-94	37.2	37.5	37.6	28.3	30.6	32.4
03-23-94	36.9	37.3	37.6	24.9	29.7	33.0
03-24-94	36.9	37.1	37.2	25.2	30.8	35.1

Sullivan Creek Air & Water Temperatures At Mill Pond

<u>Date</u>	Water			Air		
	<u>Min</u>	<u>Avg</u>	<u>Max</u>	<u>Min</u>	<u>Avg</u>	<u>Max</u>
03-25-94	37.2	37.5	37.6	26.6	31.5	36.3
03-26-94	37.6	37.9	38.2	29.7	33.9	39.8
03-27-94	37.9	38.3	38.5	30.9	34.9	39.5
03-28-94	38.2	38.7	39.1	32.7	37.6	43.7
03-29-94	38.8	39.1	39.5	32.1	36.7	41.7
03-30-94	39.1	39.6	39.8	32.4	37.4	42.7
03-31-94	39.8	39.8	40.1	33.3	38.0	43.7
04-01-94	39.5	39.8	40.1	35.1	38.5	42.7
04-02-94	39.1	39.4	39.8	35.4	39.1	43.7
04-03-94	39.1	39.4	39.8	37.9	38.7	39.5
04-04-94	39.1	39.1	39.1	37.6	38.5	40.1
04-05-94	38.8	39.2	39.5	34.5	37.5	39.1
04-06-94	38.8	39.0	39.1	34.5	35.8	37.6
04-07-94	38.5	38.8	39.1	35.4	36.7	38.2
04-08-94	39.1	39.1	39.1	35.7	37.1	38.5
04-09-94	39.1	39.2	39.5	36.6	38.3	41.1
04-10-94	39.1	39.5	39.8	37.9	40.4	43.7
04-11-94	39.8	40.7	41.4	36.6	41.4	46.1
04-12-94	40.7	41.0	41.1	39.5	41.4	43.0
04-13-94	39.5	40.2	41.1	37.2	38.5	40.7
04-14-94	38.8	39.1	39.5	33.0	36.3	39.1
04-15-94	39.5	39.9	40.7	35.7	40.2	45.8
04-16-94	40.4	41.0	42.1	39.1	44.2	50.8
04-17-94	41.1	41.7	42.7	42.7	46.6	51.2
04-18-94	40.7	41.7	42.7	41.1	45.5	49.3
04-19-94	40.1	40.7	41.7	42.4	43.8	46.1
04-20-94	38.8	39.9	40.4	40.4	42.8	45.4
04-21-94	38.8	39.8	40.7	40.1	42.4	46.1
04-22-94	38.5	39.5	40.1	39.5	40.9	42.1
04-23-94	38.8	39.6	40.4	38.5	41.0	43.4
04-24-94	38.8	39.4	40.1	37.2	40.0	42.1
04-25-94	39.1	39.5	39.8	39.8	40.7	42.4
04-26-94	38.8	39.7	40.4	36.3	40.5	43.7
04-27-94	39.1	39.9	40.4	36.0	40.8	44.7
04-28-94	39.8	40.5	41.4	37.9	41.6	45.1
04-29-94	40.1	40.9	42.1	35.7	41.8	48.2
04-30-94	40.4	40.7	41.4	39.8	41.5	43.0
05-01-94	39.8	40.0	40.4	36.6	39.3	41.1
05-02-94	39.5	39.9	40.4	36.6	40.3	43.4
05-03-94	39.5	40.3	41.4	35.7	41.6	47.5
05-04-94	40.4	40.8	41.1	41.4	42.4	43.4
05-05-94	40.4	41.2	43.0	38.5	43.6	49.3
05-06-94	41.4	42.6	44.1	39.5	46.1	52.7
05-07-94	42.4	43.8	45.4	43.4	48.8	54.3
05-08-94	42.7	43.9	44.7	43.7	48.4	53.1
05-09-94	42.4	43.4	44.4	43.7	47.8	52.7
05-10-94	42.1	43.1	44.1	44.1	46.5	49.7
05-11-94	42.1	42.8	43.4	43.0	45.9	49.0
05-12-94	42.1	42.9	43.7	43.7	45.6	48.2
05-13-94	41.7	42.5	43.4	41.7	43.9	46.5
05-14-94	41.4	42.2	42.7	39.8	43.8	46.8
05-15-94	41.7	42.1	42.7	43.0	43.3	44.1
05-16-94	41.1	41.7	42.1	41.4	42.9	45.1
05-17-94	41.1	41.9	43.0	37.6	43.0	47.5
05-18-94	42.4	42.9	43.7	43.4	45.2	48.2
05-19-94	42.4	42.9	43.4	40.7	44.1	47.5
05-20-94	42.4	42.8	43.4	43.4	44.4	46.5
05-21-94	42.7	43.1	43.7	43.0	44.7	46.5
05-22-94	42.7	43.5	44.7	41.1	45.2	48.6
05-23-94	43.4	44.6	46.1	42.4	47.7	52.3
05-24-94	44.7	46.0	47.5	45.4	50.7	56.3
05-25-94	45.8	47.2	48.2	47.2	51.0	56.7
05-26-94	46.5	47.1	47.5	48.2	50.7	53.5
05-27-94	46.1	46.7	47.5	45.4	48.3	51.2
05-28-94	45.1	45.6	46.5	42.4	45.9	49.3

Sullivan Creek Air & Water Temperatures At Mill Pond

Date	Water			Air		
	Min	Avg	Max	Min	Avg	Max
05-29-94	44.4	44.5	44.7	42.4	44.3	45.1
05-30-94	43.4	44.2	45.4	38.5	43.7	49.0
05-31-94	43.7	44.6	45.4	39.5	46.0	51.2
06-01-94	45.1	45.4	45.8	46.8	48.6	50.8
06-02-94	44.7	46.2	47.5	41.1	49.6	56.7
06-03-94	46.5	47.9	49.7	45.1	52.8	60.9
06-04-94	47.5	48.4	49.3	47.9	50.5	53.1
06-05-94	46.1	47.1	48.2	43.7	48.7	53.1
06-06-94	46.5	47.1	47.9	46.1	48.6	50.1
06-07-94	45.4	45.9	46.5	43.4	45.0	47.2
06-08-94	45.1	45.7	46.5	43.0	45.6	49.3
06-09-94	45.1	45.7	46.8	43.0	47.2	50.8
06-10-94	45.4	46.4	47.5	43.7	49.1	53.5
06-11-94	46.8	47.5	48.2	47.9	51.6	55.9
06-12-94	47.5	48.1	49.0	48.2	51.7	55.1
06-13-94	47.9	48.4	49.3	45.8	49.4	50.4
06-14-94	46.8	47.8	48.6	40.7	44.8	48.6
06-15-94	46.8	47.5	48.2	43.7	47.1	51.6
06-16-94	46.5	47.4	48.6	44.1	47.1	50.8
06-17-94	48.6	49.6	51.2	46.5	49.9	54.7
06-18-94	49.7	50.3	50.8	44.7	48.4	52.3
06-19-94	49.7	50.9	52.3	43.4	50.1	57.5
06-20-94	51.2	52.5	53.9	45.4	53.3	60.9
06-21-94	52.7	54.1	55.9	49.7	57.6	65.5
06-22-94	54.3	55.6	57.1	53.1	60.3	67.9
06-23-94	55.5	56.0	56.7	55.5	59.7	69.4
06-24-94	55.9	56.8	57.5	55.9	58.7	61.8
06-25-94	55.1	56.3	57.5	50.4	57.9	64.5
06-26-94	54.7	55.5	56.7	53.5	55.3	59.6
06-27-94	53.1	54.2	55.5	49.3	54.5	60.5
06-28-94	53.9	55.3	57.5	50.4	58.5	67.4
06-29-94	54.7	55.5	56.3	53.9	56.0	58.8
06-30-94	55.5	56.8	57.9	56.7	62.3	66.9
07-01-94	55.9	56.7	57.5	55.1	59.1	63.2
07-02-94	55.1	55.7	56.3	49.0	52.5	57.1
07-03-94	54.7	55.0	55.5	48.2	52.0	55.9
07-04-94	53.9	54.7	55.5	47.5	53.2	57.9
07-05-94	53.9	55.1	56.3	47.9	55.6	63.2
07-06-94	55.1	56.1	57.5	51.6	57.5	64.5
07-07-94	56.3	56.7	57.5	53.5	56.8	63.6
07-08-94	57.9	58.7	59.6	63.2	66.7	70.0
07-09-94	57.1	58.2	59.2	54.7	61.9	70.0
07-10-94	57.5	58.4	59.6	51.9	60.1	69.4
07-11-94	57.5	58.7	59.2	52.7	61.1	70.0
07-12-94	57.5	58.6	59.6	52.7	60.5	68.9
07-13-94	57.9	59.1	60.0	53.5	61.5	70.5
07-14-94	58.8	59.4	60.0	58.8	62.7	69.4
07-16-94	58.3	59.6	60.5	55.5	63.5	72.1
07-17-94	59.2	60.0	60.9	57.9	64.5	71.0
07-18-94	59.6	59.9	60.5	58.8	62.9	66.9
07-19-94	58.8	59.8	60.9	53.1	61.3	70.0
07-20-94	59.6	60.6	62.2	55.5	64.7	74.8
07-21-94	60.5	61.7	62.7	59.2	68.0	77.1
07-22-94	61.4	62.4	64.1	60.5	69.3	79.0
07-23-94	61.8	63.0	64.1	62.2	70.0	79.0
07-24-94	62.2	63.4	64.5	63.6	70.5	79.0
07-25-94	63.2	64.4	66.0	66.4	72.2	79.6
07-26-94	63.2	64.4	65.5	63.2	70.2	77.7
07-27-94	63.2	64.0	65.0	58.8	67.5	76.0
07-28-94	62.7	63.3	64.5	57.9	63.6	70.0
07-29-94	61.8	62.8	64.5	56.7	66.4	78.4
07-30-94	62.2	63.1	64.5	59.6	67.2	76.0
07-31-94	61.8	62.8	63.6	57.1	65.5	74.3
08-01-94	61.8	62.7	63.6	57.9	66.4	76.6

Sullivan Creek Air & Water Temperatures At Mill Pond

<u>Date</u>	Water			Air		
	<u>Min</u>	<u>Avg</u>	<u>Max</u>	<u>Min</u>	<u>Avg</u>	<u>Max</u>
08-02-94	62.2	63.3	64.5	61.4	68.9	76.6
08-03-94	62.7	63.9	65.0	62.7	70.8	81.5
08-04-94	63.2	63.7	64.5	61.8	68.1	74.3
08-05-94	63.2	63.9	64.5	60.5	66.7	73.2
08-06-94	62.7	63.4	64.5	55.5	62.2	68.9
08-07-94	62.2	62.9	63.6	53.9	62.8	72.6
08-08-94	61.8	62.4	63.2	58.8	61.4	64.5
08-09-94	60.9	61.8	62.7	53.1	58.7	66.4
08-10-94	60.5	61.4	62.2	50.8	60.4	72.1
08-11-94	60.9	61.7	62.2	53.1	64.2	74.8
08-12-94	60.9	62.0	63.2	55.1	65.6	77.7
08-13-94	61.8	62.6	63.6	57.9	67.6	79.6
08-14-94	61.8	62.9	63.6	57.9	67.5	80.8
08-15-94	61.8	62.8	63.6	58.8	65.6	72.6
08-16-94	61.8	62.7	63.6	55.9	63.7	72.6
08-17-94	61.8	62.4	63.2	55.5	62.0	70.0
08-18-94	60.9	61.8	62.7	52.3	62.0	72.6
08-19-94	61.4	61.9	62.7	54.3	64.0	75.4
08-20-94	61.4	61.8	62.2	56.3	64.4	73.7
08-21-94	60.9	61.7	62.2	54.3	62.2	70.0
08-22-94	60.9	61.3	62.2	53.5	58.7	63.6
08-23-94	59.6	60.3	60.9	51.6	58.2	66.4
08-24-94	59.2	59.9	60.5	49.7	58.2	67.9
08-25-94	59.2	59.7	60.0	51.2	59.2	66.4
08-26-94	58.8	58.9	59.2	53.5	56.4	60.5
08-27-94	57.5	58.4	59.2	45.4	54.7	65.5
08-28-94	57.9	58.7	59.6	48.2	57.6	68.9
08-29-94	58.3	59.0	59.6	51.9	56.8	62.2
08-30-94	57.9	58.9	60.0	49.7	57.4	66.9
08-31-94	58.3	59.3	60.5	50.4	60.0	70.0
09-01-94	58.3	59.1	60.0	50.1	59.2	70.0
09-02-94	58.8	59.3	60.0	51.6	58.9	68.9
09-03-94	57.9	58.5	59.6	50.4	53.2	57.5
09-04-94	57.1	57.6	57.9	46.8	50.8	55.5
09-05-94	56.7	57.5	57.9	44.7	52.0	60.5
09-06-94	56.7	57.7	58.3	46.8	55.1	65.5
09-07-94	57.1	58.0	58.8	49.3	57.2	67.4
09-08-94	57.5	58.2	59.2	53.9	60.2	70.5
09-09-94	57.1	57.8	58.8	49.0	53.8	59.6
09-10-94	56.3	56.5	57.1	45.8	48.8	51.9
09-11-94	55.5	55.9	56.3	45.1	49.2	54.3
09-12-94	55.1	55.7	55.9	41.4	48.3	56.3
09-13-94	54.7	55.6	56.3	42.1	50.2	59.6
09-14-94	55.5	55.7	55.9	50.1	53.8	58.8
09-15-94	55.5	56.0	56.7	52.7	56.1	62.2
09-16-94	55.5	56.3	57.1	49.0	55.5	63.2
09-17-94	55.9	56.9	57.5	50.1	57.2	66.0
09-18-94	56.3	56.9	57.5	50.1	57.0	65.0
09-19-94	56.3	56.7	57.5	48.6	51.8	56.7
09-20-94	56.3	56.9	57.1	53.9	58.8	63.2
09-21-94	55.9	56.6	57.1	47.5	53.3	59.2
09-22-94	55.9	56.5	57.1	46.5	53.0	60.5
09-23-94	55.5	56.3	56.7	47.5	54.0	60.9
09-24-94	55.5	56.3	56.7	48.2	54.8	61.4
09-25-94	55.5	56.2	56.7	48.6	55.2	63.2
09-26-94	55.5	56.1	56.7	49.0	55.1	61.8
09-27-94	55.5	56.1	56.7	49.0	55.1	62.7
09-28-94	55.5	55.9	56.3	49.7	55.0	59.6
09-29-94	55.1	55.7	55.9	49.7	54.8	61.4
09-30-94	55.5	55.6	55.9	51.6	54.2	56.7
10-01-94	55.1	55.2	55.5	49.7	52.1	54.7
10-02-94	53.9	54.4	55.1	42.1	45.6	49.3
10-03-94	53.5	53.9	54.3	42.1	46.1	52.3
10-04-94	53.1	53.5	53.9	39.8	44.6	49.7
10-05-94	52.7	53.3	53.5	38.8	44.3	50.1

Sullivan Creek Air & Water Temperatures At Mill Pond

Date	Water			Air		
	Min	Avg	Max	Min	Avg	Max
10-06-94	52.7	53.1	53.5	40.1	45.2	50.8
10-07-94	52.7	53.1	53.5	39.5	44.9	50.1
10-08-94	52.7	53.4	53.9	40.7	45.6	51.6
10-09-94	53.5	53.9	54.3	42.1	47.4	52.7
10-10-94	53.9	54.4	54.7	47.5	50.0	53.5
10-11-94	54.3	54.6	55.1	47.5	50.2	54.3
10-12-94	54.3	54.5	54.7	42.1	46.6	51.6
10-13-94	53.9	54.1	54.3	40.1	44.8	49.3
10-14-94	53.5	54.0	54.3	41.4	43.6	47.2
10-15-94	53.5	53.5	53.5	40.7	43.1	46.8
10-16-94	53.1	53.2	53.5	38.2	42.1	46.5
10-17-94	52.7	52.8	53.1	37.6	41.6	45.8
10-18-94	52.3	52.4	52.7	39.5	41.5	44.7
10-19-94	51.9	51.9	52.3	37.2	40.1	43.4
10-20-94	51.9	51.9	51.9	41.4	43.3	45.8
10-21-94	51.6	51.8	51.9	40.4	43.1	45.8
10-22-94	50.8	51.2	51.6	34.8	38.5	41.4
10-23-94	50.8	51.0	51.2	40.1	42.0	44.7
10-24-94	50.4	50.6	50.8	35.7	39.6	43.7
10-25-94	50.1	50.3	50.4	36.0	39.6	43.7
10-26-94	50.4	50.6	50.8	41.7	45.4	48.2
10-27-94	50.4	50.5	50.8	44.4	45.7	46.8
10-28-94	49.7	49.9	50.4	39.1	42.0	44.4
10-29-94	49.0	49.1	49.3	37.2	38.3	39.5
10-30-94	48.2	48.3	48.6	35.1	36.4	38.5
10-31-94	47.5	47.7	48.2	36.6	37.0	37.6
11-01-94	47.2	47.4	47.5	34.8	37.2	38.5
11-02-94	46.1	46.8	47.2	29.5	34.0	36.0
11-03-94	45.4	45.8	46.5	25.5	30.1	34.8
11-04-94	44.7	45.1	45.4	31.6	33.4	34.6
11-05-94	44.4	44.5	44.7	26.0	30.7	33.6
11-06-94	43.7	44.1	44.4	28.2	31.0	34.1
11-07-94	44.1	44.1	44.1	32.5	34.0	34.6
11-08-94	44.1	44.2	44.4	34.6	35.2	36.2
11-09-94	43.7	43.8	44.1	34.6	34.9	35.1
11-10-94	43.7	43.7	43.7	35.1	36.0	37.3
11-11-94	43.4	43.7	43.7	35.1	35.7	36.2
11-12-94	43.0	43.4	43.4	34.1	35.7	37.3
11-13-94	42.4	42.5	43.0	26.0	30.2	33.0
11-14-94	42.4	42.4	42.4	31.1	33.6	35.1
11-15-94	42.1	42.2	42.4	33.0	34.2	34.6
11-16-94	41.4	41.8	42.1	33.0	34.1	34.6
11-17-94	40.7	41.2	41.4	26.0	31.8	33.0
11-18-94	40.1	40.3	40.7	23.9	27.3	29.2
11-19-94	40.1	40.1	40.1	28.7	29.7	30.6
11-20-94	39.5	39.8	40.1	25.2	29.5	30.6
11-21-94	38.2	38.6	39.1	19.5	22.0	24.7
11-22-94	37.9	38.1	38.2	19.1	22.7	25.6
11-23-94	37.9	38.2	38.5	23.9	27.3	29.6
11-24-94	38.2	38.5	38.5	29.6	30.4	31.1
11-25-94	38.5	38.5	38.5	31.1	31.3	32.0
11-26-94	38.5	38.6	38.8	30.6	32.0	33.0
11-27-94	38.2	38.3	38.5	28.2	29.8	30.6
11-28-94	37.6	37.9	38.2	25.6	28.5	30.1
11-29-94	37.2	37.3	37.6	25.2	28.2	30.6
11-30-94	37.2	37.6	37.9	30.6	32.4	36.2
12-01-94	37.2	37.5	37.9	31.6	32.9	35.7
12-02-94	36.9	37.4	38.5	30.6	31.9	33.0
12-03-94	35.7	36.5	36.9	19.9	24.9	30.6
12-04-94	34.5	34.8	35.7	10.4	13.7	18.8
12-05-94	34.2	34.5	34.8	7.3	10.9	14.8
12-06-94	34.5	34.8	35.1	12.1	16.1	19.9
12-07-94	35.1	35.1	35.1	19.1	21.1	23.1
12-08-94	34.8	34.9	35.1	21.9	23.0	24.7
12-09-94	34.8	34.8	34.8	24.7	25.4	26.0

Sullivan Creek Air & Water Temperatures At Mill Pond

Date	Water			Air		
	Min	Avg	Max	Min	Avg	Max
12-10-94	34.5	34.8	34.8	22.7	24.3	25.6
12-11-94	34.8	34.8	35.1	25.6	26.6	27.8
12-12-94	34.8	34.8	35.1	26.0	26.9	28.2
12-13-94	34.2	34.4	34.8	19.5	22.4	25.2
12-14-94	34.5	34.5	34.5	23.5	24.6	25.6
12-15-94	34.5	34.5	34.5	25.6	26.6	27.8
12-16-94	34.5	34.8	34.8	27.8	28.5	29.6
12-17-94	34.8	34.8	35.1	29.6	30.1	30.6
12-18-94	34.8	34.8	34.8	30.6	30.6	30.6
12-19-94	34.8	34.8	34.8	30.6	30.6	30.6
12-20-94	34.8	34.8	35.1	30.6	30.9	31.1
12-21-94	35.1	35.1	35.1	31.1	31.1	31.1
12-22-94	35.1	35.1	35.1	30.6	31.0	31.1
12-23-94	35.1	35.1	35.1	30.6	30.6	30.6
12-24-94	34.8	34.9	35.1	26.5	28.7	30.6
12-25-94	34.8	35.0	35.1	29.2	29.7	30.1
12-26-94	34.8	35.0	35.1	30.1	30.4	30.6
12-27-94	34.8	34.8	35.1	30.6	30.6	30.6
12-28-94	34.8	34.9	35.1	30.6	30.9	31.1
12-29-94	34.5	34.8	35.1	26.0	29.6	31.1
12-30-94	33.3	33.8	34.5	17.7	21.2	26.0
12-31-94	32.7	32.9	33.3	12.1	14.5	17.3
01-01-95	31.8	32.3	32.7	8.5	11.4	13.8
01-02-95	31.5	31.8	32.1	7.3	10.4	13.4
01-03-95	31.2	31.5	31.8	7.0	9.8	12.4
01-04-95	30.9	31.1	31.5	5.8	8.6	11.1
01-05-95	30.6	30.8	31.2	5.2	8.2	11.1
01-06-95	30.9	31.1	31.5	8.5	11.9	15.1
01-07-95	30.9	31.1	31.5	10.1	12.9	16.9
01-08-95	31.5	31.8	32.1	17.3	20.1	22.7
01-09-95	32.1	32.5	33.9	22.7	26.6	31.1
01-10-95	32.7	32.9	33.0	30.1	30.5	30.6
01-11-95	33.0	33.0	33.0	30.6	30.6	30.6
01-12-95	33.0	33.1	33.3	30.6	30.7	31.1
01-13-95	33.3	33.3	33.3	30.6	30.7	31.1
01-14-95	33.3	33.5	33.6	30.6	30.7	31.1
01-15-95	33.6	33.6	33.6	30.6	30.9	31.6
01-16-95	33.6	33.8	33.9	30.6	31.0	31.6
01-17-95	33.9	33.9	34.2	30.6	30.8	31.1
01-18-95	34.2	34.2	34.2	30.6	30.6	30.6
01-19-95	34.2	34.2	34.5	30.6	30.6	31.1
01-20-95	33.9	34.0	34.5	26.0	28.7	30.6
01-21-95	33.3	33.5	33.9	21.5	23.8	26.0
01-22-95	33.0	33.2	33.3	19.1	21.7	23.5
01-23-95	32.1	32.6	33.0	13.1	16.9	20.3
01-24-95	31.8	32.4	33.0	12.4	16.9	22.3
01-25-95	32.7	33.0	33.3	22.3	24.8	27.3
01-26-95	33.3	33.3	33.3	27.3	28.6	29.6
01-27-95	33.6	33.6	33.6	29.6	30.3	30.6
01-28-95	33.6	33.6	33.9	29.2	30.4	30.6
01-29-95	33.6	33.7	33.9	29.2	29.9	30.6
01-30-95	33.9	33.9	33.9	30.6	30.6	30.6
01-31-95	33.9	34.1	34.2	30.6	30.9	31.6
02-01-95	34.2	34.2	34.2	31.1	31.2	31.6
02-02-95	34.2	34.2	34.5	31.1	31.2	31.6
02-03-95	34.2	34.5	34.5	30.6	31.2	32.0
02-04-95	34.2	34.4	34.5	29.6	30.4	30.6
02-05-95	34.2	34.5	34.5	30.1	30.5	30.6
02-06-95	34.5	34.7	34.8	30.6	30.9	31.1
02-07-95	34.8	34.9	35.1	30.6	31.2	32.0
02-08-95	34.8	34.8	34.8	30.1	30.5	30.6
02-09-95	34.5	34.7	34.8	26.0	28.8	30.1
02-10-95	34.2	34.5	34.8	23.9	27.2	29.6
02-11-95	33.9	34.5	34.8	21.5	25.8	27.8
02-12-95	33.0	33.2	33.9	13.8	16.1	20.3

Sullivan Creek Air & Water Temperatures At Mill Pond

Date	Water			Air		
	Min	Avg	Max	Min	Avg	Max
02-13-95	32.4	32.7	33.0	12.7	14.9	16.9
02-14-95	31.8	32.4	33.0	6.7	12.6	17.3
02-15-95	32.7	32.8	33.0	16.6	18.5	21.5
02-16-95	33.0	33.2	33.6	21.5	24.3	27.8
02-17-95	33.6	33.6	33.9	27.8	29.5	31.1
02-18-95	33.6	33.7	33.9	30.6	30.6	31.1
02-19-95	33.9	33.9	33.9	31.1	31.6	32.0
02-20-95	33.9	33.9	34.2	31.6	32.4	34.6
02-21-95	33.9	34.0	34.2	31.1	31.9	33.6
02-22-95	33.9	34.1	34.2	30.6	31.4	33.0
02-23-95	33.9	34.2	34.5	30.1	30.6	31.1
02-24-95	34.2	34.4	34.8	30.6	31.3	32.5
02-25-95	34.8	34.9	35.1	31.1	32.5	35.1
02-26-95	34.8	34.9	35.1	29.2	30.5	31.1
02-27-95	34.2	34.6	34.8	24.3	27.3	29.6
02-28-95	33.6	34.3	34.5	19.5	24.2	27.8
03-01-95	33.6	34.2	34.5	18.4	23.4	27.8
03-02-95	33.6	34.0	34.5	16.9	22.7	27.8
03-03-95	33.6	34.1	34.5	18.4	24.3	29.6
03-04-95	34.2	34.4	34.5	28.7	29.3	30.1
03-05-95	34.2	34.3	34.5	25.2	28.3	29.6
03-06-95	33.6	33.9	34.2	18.0	23.0	26.0
03-07-95	33.9	34.1	34.5	23.9	26.6	29.6
03-08-95	34.2	34.2	34.5	26.0	27.7	29.6
03-09-95	34.2	34.5	34.8	29.6	30.7	32.0
03-10-95	34.5	34.8	35.1	31.1	33.3	36.2
03-11-95	34.8	35.0	35.1	32.5	35.0	37.9
03-12-95	34.8	34.9	35.1	31.6	33.1	35.1
03-13-95	34.8	35.2	35.4	31.1	32.5	34.1
03-14-95	35.4	35.7	36.0	33.0	34.2	35.7
03-15-95	36.0	36.2	36.6	34.1	35.2	37.3
03-16-95	36.0	36.3	36.6	30.6	33.5	36.7
03-17-95	36.0	36.5	36.9	30.6	33.0	36.2
03-18-95	36.9	36.9	36.9	33.6	34.3	35.1
03-19-95	36.9	37.1	37.2	34.6	35.3	36.7
03-20-95	37.2	37.2	37.2	33.0	34.3	35.1
03-21-95	37.2	37.3	37.6	33.0	34.3	35.7
03-22-95	36.6	37.0	37.2	31.1	33.2	36.2
03-23-95	36.6	36.9	36.9	32.5	34.0	36.2
03-24-95	36.6	36.8	36.9	31.6	33.5	35.1
03-25-95	36.3	36.7	36.9	30.1	31.0	32.0
03-26-95	36.3	36.6	36.9	30.1	31.7	34.6
03-27-95	36.3	37.1	38.2	30.1	33.9	40.2
03-28-95	36.6	37.4	37.9	30.6	35.0	40.2
03-29-95	37.2	37.9	38.5	30.6	35.8	42.0
03-30-95	37.6	38.4	39.1	32.0	37.1	43.3
03-31-95	38.2	38.7	39.5	32.5	38.8	45.9
04-01-95	38.8	39.2	39.5	36.2	39.6	42.0
04-02-95	38.5	38.8	39.1	33.0	36.6	40.8
04-03-95	38.5	39.0	39.8	32.5	38.5	45.2
04-04-95	38.8	39.2	39.8	35.1	39.9	45.2
04-05-95	38.8	39.3	39.8	33.6	38.3	42.0
04-06-95	39.1	39.4	39.5	36.2	38.8	41.4
04-07-95	38.5	39.1	39.5	34.1	38.1	42.0
04-08-95	39.1	39.2	39.5	34.6	37.7	39.6
04-09-95	38.5	38.9	39.1	33.0	35.8	39.6
04-10-95	38.5	38.9	39.5	30.6	35.4	39.6
04-11-95	39.1	39.4	39.8	34.6	37.8	40.8
04-12-95	39.1	39.4	39.8	31.6	35.0	38.4
04-13-95	39.1	39.3	39.8	36.2	38.3	40.8
04-14-95	38.8	39.2	39.5	33.6	34.9	37.3
04-15-95	38.5	39.2	39.8	33.6	34.9	37.3
04-16-95	38.5	39.3	40.1	30.6	35.0	40.2
04-17-95	38.8	39.3	39.8	31.1	36.0	40.2
04-18-95	39.1	39.5	40.1	35.1	38.5	41.4

Sullivan Creek Air & Water Temperatures At Mill Pond

Date	Water			Air		
	Min	Avg	Max	Min	Avg	Max
04-19-95	39.5	39.7	39.8	34.6	37.5	39.0
04-20-95	38.8	39.5	39.8	32.0	36.1	40.8
04-21-95	39.1	39.8	40.4	32.0	37.9	43.9
04-22-95	39.8	40.3	40.7	33.0	40.1	46.6
04-23-95	40.4	41.1	42.1	34.6	42.1	49.5
04-24-95	41.4	42.1	42.4	39.0	43.5	48.0
04-25-95	41.7	42.6	43.4	37.9	44.0	49.5
04-26-95	42.4	42.9	43.4	41.1	45.5	51.6
04-27-95	42.1	42.8	43.4	38.5	45.6	53.1
04-28-95	42.4	42.8	43.4	39.1	45.7	50.4
04-29-95	42.1	42.6	43.0	37.6	44.0	49.0
04-30-95	41.7	42.4	43.0	33.9	41.9	49.7
05-01-95	41.4	42.4	43.0	36.3	45.1	53.9
05-02-95	42.1	42.3	42.7	43.7	44.7	46.5
05-03-95	41.7	42.0	42.4	40.4	43.0	44.7
05-04-95	41.1	41.7	42.4	37.6	42.6	48.6
05-05-95	41.7	42.0	42.1	42.4	45.1	48.2
05-06-95	41.4	41.9	42.1	43.0	45.6	48.6
05-07-95	41.4	41.8	42.1	43.4	45.7	49.0
05-08-95	41.1	41.9	42.7	42.1	46.7	51.9
05-09-95	41.1	41.7	42.1	42.7	46.5	50.1
05-10-95	41.1	41.6	42.1	43.4	46.2	51.6
05-11-95	40.4	41.0	41.7	42.4	43.2	44.4
05-12-95	40.1	40.4	41.1	41.1	41.8	42.4
05-13-95	39.5	40.6	42.1	36.3	41.8	46.5
05-14-95	40.4	41.5	43.0	38.5	44.6	50.8
05-15-95	41.4	42.5	43.4	43.7	47.0	51.6
05-16-95	41.1	42.1	43.0	41.1	45.9	50.1
05-17-95	41.1	41.6	42.4	43.0	45.1	48.2
05-18-95	40.4	41.3	42.1	41.4	43.2	45.1
05-19-95	39.8	41.3	42.4	36.0	41.3	48.6
05-20-95	40.4	41.4	42.7	37.6	42.9	47.2
05-21-95	40.7	41.9	43.0	38.5	43.4	47.5
05-22-95	41.1	42.2	43.4	38.5	44.5	50.1
05-23-95	41.7	42.6	43.4	40.7	46.7	51.9
05-24-95	42.1	42.8	43.4	42.7	47.2	51.2
05-25-95	42.1	43.0	43.7	44.4	46.8	50.1
05-26-95	41.4	42.5	43.7	37.6	44.2	50.4
05-27-95	42.1	43.2	44.7	40.7	47.2	53.1
05-28-95	43.0	44.3	45.8	44.1	49.9	55.5
05-29-95	43.7	45.0	46.1	46.5	51.2	55.9
05-30-95	43.7	45.1	46.1	46.1	50.9	55.5
05-31-95	43.7	45.0	46.1	46.1	50.0	54.3
06-01-95	43.7	45.0	46.1	45.1	50.1	55.5
06-02-95	44.4	45.2	46.1	46.8	47.9	49.7
06-03-95	45.8	46.9	48.6	46.1	49.9	53.9
06-04-95	48.2	49.2	50.4	49.3	52.5	55.5
06-05-95	49.0	49.6	50.4	48.6	50.3	53.1
06-06-95	48.6	48.8	49.3	44.7	46.1	48.2
06-07-95	47.5	49.0	50.4	44.1	47.2	50.8
06-08-95	49.0	49.9	50.4	43.4	47.8	51.6
06-09-95	49.0	49.7	50.4	44.7	49.0	52.7
06-10-95	49.3	50.4	51.6	46.5	51.0	54.7
06-11-95	51.2	51.9	52.7	50.1	51.7	53.1
06-12-95	50.8	51.6	52.3	44.4	50.1	54.7
06-13-95	50.4	50.8	51.6	49.3	50.9	52.3
06-14-95	49.3	49.6	50.4	48.6	49.7	50.4
06-15-95	48.6	49.5	50.4	48.2	51.3	54.7
06-16-95	50.1	51.1	52.7	50.4	53.9	57.9
06-17-95	51.6	52.0	52.7	50.4	52.8	54.7
06-18-95	50.4	51.1	51.6	46.5	50.0	52.3
06-19-95	50.4	50.7	51.2	47.9	50.1	55.0
06-20-95	49.0	49.7	50.4	47.9	48.7	49.5
06-21-95	48.6	48.9	49.3	48.2	49.8	51.9
06-22-95	49.3	49.9	50.8	49.3	51.9	55.9

Sullivan Creek Air & Water Temperatures At Mill Pond

Date	Water			Air		
	Min	Avg	Max	Min	Avg	Max
06-23-95	50.1	51.3	53.1	49.3	53.6	57.9
06-24-95	52.3	53.4	55.1	51.6	55.9	59.6
06-25-95	53.9	55.2	56.7	52.5	57.2	60.9
06-26-95	54.7	55.9	56.7	52.3	56.8	60.9
06-27-95	54.7	55.4	56.3	48.7	53.6	56.7
06-28-95	53.5	54.2	54.7	48.7	54.0	58.8
06-29-95	53.5	54.6	56.3	49.7	56.4	63.5
06-30-95	54.7	55.5	57.1	52.7	58.3	62.4
07-01-95	54.7	55.8	56.7	53.5	59.6	65.6
07-02-95	55.1	55.8	56.7	55.9	57.3	60.4
07-03-95	54.7	54.9	55.1	53.3	55.9	58.5
07-04-95	53.9	54.6	55.1	50.1	55.2	59.5
07-05-95	54.3	55.0	56.3	50.8	57.0	63.5
07-06-95	54.7	55.5	56.3	51.2	58.2	64.5
07-07-95	55.1	55.8	56.7	55.9	59.9	63.6
07-08-95	55.5	56.5	58.3	55.9	61.3	67.9
07-09-95	57.1	58.1	59.2	59.2	62.6	66.4
07-10-95	57.5	58.2	58.8	58.3	60.3	62.4
07-11-95	56.7	57.7	58.3	51.2	57.5	64.5
07-12-95	56.3	57.4	58.3	49.3	57.3	65.6
07-13-95	56.3	57.6	58.8	50.8	58.9	66.7
07-14-95	56.7	57.8	59.2	53.3	60.4	67.9
07-15-95	57.5	58.3	59.6	55.5	59.7	64.1
07-16-95	57.5	58.7	59.6	51.6	60.0	69.0
07-17-95	57.9	58.9	60.0	52.5	62.1	71.5
07-18-95	58.3	59.4	60.0	55.0	63.1	70.5
07-19-95	58.8	59.8	60.9	55.9	64.3	73.7
07-20-95	59.6	60.5	61.8	56.7	65.6	74.3
07-21-95	59.6	60.2	60.9	60.9	62.7	66.7
07-22-95	58.8	59.6	60.9	53.3	60.9	67.9
07-23-95	59.2	60.0	60.9	56.7	63.0	69.0
07-24-95	59.2	59.7	60.5	56.3	61.6	66.7
07-25-95	58.8	59.5	60.5	55.9	62.5	69.0
07-26-95	58.8	59.4	60.0	57.1	59.7	62.4
07-27-95	57.9	58.9	60.0	50.8	56.2	61.4
07-28-95	57.9	59.0	60.0	49.0	58.3	70.3
07-29-95	58.3	59.0	59.6	55.5	58.8	62.4
07-30-95	57.9	58.6	59.2	48.6	55.9	62.7
07-31-95	57.9	59.0	60.5	51.9	59.7	69.0
08-01-95	58.3	59.1	59.6	53.9	61.6	69.0
08-02-95	58.8	59.2	60.0	56.3	62.0	66.9
08-03-95	58.8	59.6	60.5	55.5	62.0	69.0
08-04-95	59.2	60.0	61.4	55.5	64.0	73.2
08-05-95	60.0	61.0	62.2	57.6	66.5	75.5
08-06-95	59.6	60.6	61.8	56.7	60.8	67.9
08-07-95	58.8	59.3	59.6	55.5	57.1	59.5
08-08-95	57.9	58.2	58.8	51.6	54.5	58.5
08-09-95	57.1	57.9	58.8	47.5	54.8	63.5
08-10-95	57.5	58.1	58.8	48.6	56.3	64.1
08-11-95	57.5	58.0	58.3	55.1	57.6	60.5
08-12-95	57.1	57.4	57.9	47.2	53.2	58.5
08-13-95	55.9	56.5	56.7	45.4	49.9	55.9
08-14-95	55.9	56.4	56.7	46.1	52.0	57.1
08-15-95	55.9	56.3	56.7	50.4	54.7	59.5
08-16-95	55.9	56.3	56.7	50.8	53.6	57.6
08-17-95	55.5	56.0	56.3	47.9	50.6	53.3
08-18-95	55.1	55.4	55.9	48.2	51.4	55.9
08-19-95	54.7	55.5	56.3	48.2	53.7	60.5
08-20-95	55.1	55.9	57.1	48.6	56.3	65.6
08-21-95	55.5	56.7	57.9	49.3	58.8	69.0
08-22-95	56.3	57.3	58.3	51.0	59.4	69.0
08-23-95	56.3	57.2	57.9	48.7	56.6	66.7
08-24-95	55.9	56.7	57.1	48.6	55.4	62.4
08-25-95	55.5	56.5	57.1	45.2	54.0	63.5
08-26-95	55.9	56.7	57.5	48.0	56.0	65.6

Sullivan Creek Air & Water Temperatures At Mill Pond

Date	Water			Air		
	Min	Avg	Max	Min	Avg	Max
08-27-95	55.5	56.3	56.7	47.3	55.0	61.4
08-28-95	55.5	56.3	56.7	48.0	55.1	61.8
08-29-95	55.9	56.2	56.7	51.2	53.9	56.7
08-30-95	55.1	55.7	56.3	46.5	51.8	57.6
08-31-95	55.1	55.8	56.7	45.8	52.8	60.0
09-01-95	55.5	56.3	57.1	46.5	54.7	63.5
09-02-95	55.9	56.9	57.9	48.2	56.9	66.7
09-03-95	56.3	57.0	57.9	49.5	57.7	65.0
09-04-95	56.7	57.7	59.2	53.3	60.1	69.0
09-05-95	57.1	57.7	58.8	54.3	57.9	61.4
09-06-95	56.7	57.3	57.9	48.2	53.9	60.5
09-07-95	56.7	57.0	57.5	51.2	55.9	61.8
09-08-95	56.7	57.2	57.9	49.0	55.4	60.9
09-09-95	56.7	57.3	57.9	49.3	56.3	63.6
09-10-95	56.7	57.6	58.3	50.1	57.3	65.6
09-11-95	57.5	58.1	59.2	52.5	59.2	66.7
09-12-95	57.1	58.0	58.8	51.6	58.6	66.7
09-13-95	57.1	57.8	58.3	50.1	58.1	67.4
09-14-95	57.5	57.9	58.3	50.2	57.8	65.6
09-15-95	57.1	57.9	58.8	50.2	58.4	67.9
09-16-95	57.1	57.7	58.3	51.0	58.1	66.0
09-17-95	57.1	57.7	58.3	49.5	56.8	64.5
09-18-95	57.1	57.6	57.9	51.6	57.6	64.5
09-19-95	57.1	57.4	57.9	52.5	56.3	61.4
09-20-95	56.3	56.8	57.5	48.7	52.2	58.5
09-21-95	55.5	56.0	56.7	40.1	48.0	56.3
09-22-95	54.7	55.3	55.9	40.1	47.8	56.3
09-23-95	54.3	54.9	55.1	42.0	49.8	59.2
09-24-95	53.9	54.6	55.1	42.6	50.6	59.6
09-25-95	53.5	54.3	54.7	42.0	50.1	58.8
09-26-95	53.5	53.7	54.3	45.4	48.6	51.0
09-27-95	53.1	53.1	53.1	46.1	48.4	50.4
09-28-95	52.7	52.8	53.1	49.3	50.4	52.5
09-29-95	52.7	52.8	53.1	47.5	49.4	51.7
09-30-95	52.3	52.7	52.7	44.1	48.2	50.2
10-01-95	51.6	51.8	52.3	37.9	42.1	45.9
10-02-95	50.8	51.2	51.6	40.1	42.0	43.9
10-03-95	50.4	50.6	50.8	43.0	44.4	46.1
10-04-95	50.1	50.3	50.4	41.1	43.2	46.6
10-05-95	49.3	49.8	50.4	35.7	40.5	45.4
10-06-95	49.3	49.6	49.7	40.2	43.1	46.8
10-07-95	49.3	49.3	49.7	40.7	43.1	45.4
10-08-95	49.0	49.2	49.3	41.7	43.2	45.9
10-09-95	48.6	49.0	49.3	39.1	42.6	45.9
10-10-95	49.3	49.6	50.1	44.4	45.9	48.0
10-11-95	50.1	50.1	50.1	44.7	46.1	47.3
10-12-95	49.7	49.8	50.1	40.2	42.4	44.6
10-13-95	49.3	49.6	49.7	38.2	40.9	43.3
10-14-95	49.3	49.3	49.7	38.5	41.0	43.4
10-15-95	49.3	49.5	49.7	40.4	43.9	48.7
10-16-95	49.7	49.9	50.4	45.1	47.1	49.5
10-17-95	49.7	50.0	50.1	42.1	43.6	45.9
11-18-95	43.0	43.0	43.0	37.9	41.7	43.9
11-19-95	42.1	42.4	43.0	33.0	35.6	37.9
11-20-95	41.1	41.4	42.1	30.6	32.1	33.0
11-21-95	40.7	41.0	41.1	31.1	33.0	34.6
11-22-95	41.1	41.2	41.4	34.1	35.4	36.7
11-23-95	41.4	41.5	41.7	36.2	38.0	40.2
11-24-95	41.7	41.9	42.1	40.2	41.1	42.0
11-25-95	41.7	42.1	42.1	38.4	41.2	42.6
11-26-95	41.4	41.5	41.7	36.2	37.4	39.0
11-27-95	40.7	41.1	41.4	34.6	35.1	36.2
11-28-95	40.4	40.6	40.7	34.6	34.8	35.1
11-29-95	40.4	40.6	41.1	35.1	39.7	43.3

Sullivan Creek Air & Water Temperatures At Mill Pond

<u>Date</u>	Water			Air		
	<u>Min</u>	<u>Avg</u>	<u>Max</u>	<u>Min</u>	<u>Avg</u>	<u>Max</u>
11-30-95	40.7	41.0	41.1	39.0	40.5	42.6
12-01-95	40.7	41.0	41.1	34.1	38.9	40.2
12-02-95	39.8	40.2	40.4	32.5	34.6	36.2
12-03-95	39.1	39.3	39.8	30.6	32.1	33.6
12-04-95	38.5	38.8	39.1	30.6	31.6	34.1
12-05-95	37.6	38.2	38.5	23.5	27.9	30.6
12-06-95	37.2	37.2	37.6	21.1	24.2	26.5
12-07-95	36.3	36.9	37.2	16.6	22.6	26.5
12-08-95	35.4	35.7	36.3	10.1	12.7	15.5
12-09-95	35.1	35.4	35.7	8.2	13.1	18.4
12-10-95	35.7	35.7	35.7	18.8	21.6	24.7
12-11-95	35.7	35.9	36.0	24.7	28.6	30.6
12-12-95	36.0	36.2	36.3	30.6	30.7	31.1
12-13-95	36.3	36.3	36.3	31.6	34.0	35.7
12-14-95	36.3	36.7	36.9	32.5	33.0	33.6
12-15-95	36.9	37.1	37.2	33.0	33.3	34.1
12-16-95	37.2	37.4	37.6	32.5	32.8	33.0
12-17-95	37.2	37.6	37.6	30.6	32.4	33.0
12-18-95	36.9	37.1	37.2	30.6	30.7	31.1
12-19-95	37.2	37.2	37.2	31.1	32.0	32.5
12-20-95	37.2	37.2	37.2	32.0	32.5	33.0
12-21-95	36.9	37.2	37.2	30.6	31.5	32.5
12-22-95	36.3	36.7	36.9	27.3	29.9	30.6
12-23-95	35.7	35.9	36.3	23.1	24.9	26.9
12-24-95	34.8	35.1	35.7	19.5	21.7	23.9
12-25-95	34.5	34.5	34.5	17.7	20.1	23.1
12-26-95	33.9	34.1	34.2	15.8	18.8	21.5
12-27-95	33.6	33.9	34.2	15.5	18.7	21.5
12-28-95	33.9	34.0	34.2	20.3	23.2	25.6
12-29-95	34.2	34.2	34.2	25.6	27.1	28.7
12-30-95	34.2	34.2	34.2	28.2	29.4	30.1
12-31-95	34.2	34.5	34.5	30.1	30.6	30.6
01-01-96	34.5	34.6	34.8	29.2	29.8	30.6
01-02-96	34.8	34.8	34.8	29.2	29.9	30.6
01-03-96	34.8	35.0	35.1	30.6	30.6	30.6
01-04-96	34.2	34.6	35.1	19.1	24.7	30.6
01-05-96	33.3	33.6	33.9	12.1	15.6	18.8
01-06-96	33.6	33.6	33.6	16.9	20.0	23.5
01-07-96	33.6	33.8	33.9	23.9	26.3	28.2
01-08-96	33.9	34.0	34.2	28.7	29.6	30.6
01-09-96	34.2	34.2	34.2	30.6	30.6	30.6
01-10-96	34.2	34.3	34.5	30.6	30.6	30.6
01-11-96	34.5	34.5	34.5	30.6	30.6	30.6
01-12-96	34.5	34.5	34.5	28.7	29.9	30.6
01-13-96	34.2	34.4	34.5	27.8	29.0	30.1
01-14-96	34.5	34.5	34.8	30.1	30.6	30.6
01-15-96	34.8	34.8	34.8	30.6	30.8	31.1
01-16-96	34.8	34.9	35.1	30.6	31.2	31.6
01-17-96	33.6	34.3	34.8	16.6	24.4	30.6
01-18-96	33.0	33.3	33.6	12.1	16.4	19.5
01-19-96	33.3	33.4	33.6	18.8	20.2	21.5
01-20-96	33.0	33.1	33.3	19.9	21.5	23.1
01-21-96	33.0	33.0	33.0	23.1	23.5	24.3
01-22-96	32.7	32.8	33.0	21.1	21.9	23.1
01-23-96	32.7	32.8	33.0	22.7	23.8	25.2
01-24-96	32.7	32.8	33.0	22.3	24.0	25.2
01-25-96	32.4	32.7	32.7	20.3	21.9	23.5
01-26-96	32.4	32.5	32.7	19.5	21.0	21.5
01-27-96	32.1	32.3	32.4	17.3	19.3	21.1
01-28-96	31.8	32.0	32.4	15.1	17.7	20.7
01-29-96	30.9	31.1	31.5	6.7	9.9	14.4
01-30-96	30.0	30.3	30.6	-0.8	2.9	6.1
01-31-96	29.7	30.1	30.3	-1.6	2.5	5.8
02-01-96	29.5	29.9	30.3	-0.2	3.5	6.7
02-02-96	29.5	29.9	30.3	0.3	4.1	7.6
02-03-96	29.5	29.9	30.3	1.4	5.4	9.8
02-04-96	30.3	30.7	30.9	10.1	14.4	18.8

Sullivan Creek Air & Water Temperatures At Mill Pond

<u>Date</u>	Water			Air		
	<u>Min</u>	<u>Avg</u>	<u>Max</u>	<u>Min</u>	<u>Avg</u>	<u>Max</u>
02-05-96	31.2	31.3	31.5	18.8	21.8	25.6
02-06-96	31.5	31.8	31.8	26.0	27.9	28.7
02-07-96	31.8	32.0	32.1	28.7	29.6	30.1
02-08-96	32.1	32.2	32.4	30.1	30.4	30.6
02-09-96	32.1	32.2	32.4	30.6	30.6	30.6
02-10-96	31.5	31.7	31.8	24.7	27.2	30.1
02-11-96	31.2	31.5	31.8	20.3	23.4	25.2
02-12-96	31.5	31.8	32.1	22.7	25.3	27.3
02-13-96	32.1	32.2	32.4	26.0	27.7	29.2
02-14-96	32.1	32.5	32.7	26.0	27.8	29.2
02-15-96	32.4	32.6	32.7	25.6	27.7	29.2
02-16-96	32.7	32.8	33.0	25.6	27.9	29.2
02-17-96	33.0	33.1	33.3	28.7	29.7	30.6
02-18-96	33.3	33.5	33.6	30.6	30.6	30.6
02-19-96	33.6	33.7	33.9	30.6	30.6	30.6
02-20-96	33.9	34.0	34.2	30.6	31.0	32.0
02-21-96	34.2	34.2	34.2	30.6	31.5	32.5
02-22-96	34.2	34.2	34.2	30.6	30.6	31.1
02-23-96	34.2	34.2	34.2	30.1	30.5	30.6
02-24-96	33.9	34.0	34.2	26.0	28.4	30.1
02-25-96	33.0	33.4	33.9	17.7	21.7	25.2
02-26-96	32.4	32.7	33.0	12.4	17.4	21.9
02-27-96	32.1	32.4	32.7	12.7	16.1	18.8
02-28-96	31.5	32.1	32.4	9.2	15.6	21.5
02-29-96	31.8	32.1	32.4	12.7	18.4	23.5
03-01-96	32.1	32.4	32.7	16.9	22.1	27.3
03-02-96	32.1	32.5	33.0	19.1	24.7	30.1
03-03-96	32.4	32.8	33.0	23.5	27.0	30.1
03-04-96	32.7	32.8	33.0	26.0	27.6	29.6
03-05-96	32.7	32.8	33.0	23.1	24.6	26.5
03-06-96	32.7	32.7	32.7	23.9	24.1	24.7

Sullivan Creek Air & Water Temperatures at Powerhouse
Monthly Summaries

<u>Date</u>	<u>Water Min</u>	<u>Water Avg</u>	<u>Water Max</u>	<u>Air Min</u>	<u>Air Avg</u>	<u>Air Max</u>
May-93	43.4	46.5	49.7	43.0	53.8	68.9
Jun-93	Data not available					
Jul-93	Data not available					
Aug-93	51.6	55.4	59.2	49.3	55.9	62.2
Sep-93	48.6	53.2	58.8	44.4	51.7	60.5
Oct-93	Data not available					
Nov-93	Data not available					
Dec-93	35.7	36.7	37.9	21.9	29.4	33.6
Jan-94	27.5	35.6	37.2	23.5	31.8	35.4
Feb-94	23.3	33.1	36.9	3.7	27.4	34.5
Mar-94	33.3	37.1	42.1	23.8	33.8	50.1
Apr-94	39.8	41.7	44.1	35.1	42.8	50.2
May-94	38.2	45.1	54.7	36.6	46.5	59.5
Jun-94	45.8	51.6	58.8	42.1	53.2	69.4
Jul-94	53.9	60.7	67.4	48.6	63.5	81.6
Aug-94	55.5	61.8	67.4	46.5	63.2	80.0
Sep-94	53.1	56.8	61.8	42.1	55.2	73.2
Oct-94	47.9	52.5	56.3	36.0	44.6	57.6
Nov-94	37.6	42.6	48.2	21.9	33.7	39.8
Dec-94	32.1	35.8	39.1	14.4	29.0	34.1
Jan-95	27.5	33.4	36.3	8.5	26.1	33.6
Feb-95	32.1	35.2	36.9	8.5	29.5	36.7
Mar-95	33.6	37.4	41.7	16.6	32.9	46.6
Apr-95	39.1	41.5	45.8	32.0	40.3	52.5
May-95	40.7	43.7	47.2	36.3	46.1	55.1
Jun-95	44.7	51.5	57.5	44.1	52.5	66.9
Jul-95	54.3	58.8	64.1	47.5	60.7	75.5
Aug-95	53.9	57.9	64.5	46.1	57.1	79.0
Sep-95	51.6	56.4	60.5	38.5	55.1	70.0
Oct-95	48.2	50.1	52.7	36.3	45.1	51.6

Sullivan Creek Air & Water Temperatures at Powerhouse

<u>Date</u>	Water <u>Min</u>	Water <u>Avg</u>	Water <u>Max</u>	Air <u>Min</u>	Air <u>Avg</u>	Air <u>Max</u>
05-19-93	45.10	45.52	46.80	51.90	57.78	68.90
05-20-93	44.40	44.87	45.40	50.10	53.40	61.40
05-21-93	44.10	44.81	45.40	48.60	52.23	58.80
05-22-93	44.40	44.80	45.40	47.20	50.28	55.10
05-23-93	43.40	44.47	45.10	43.00	49.47	56.30
05-24-93	43.70	45.17	46.50	43.70	51.94	63.20
05-25-93	45.10	46.48	47.90	45.40	53.50	62.20
05-26-93	46.50	47.83	49.30	52.70	57.63	67.90
05-27-93	47.20	48.19	49.30	50.40	56.03	64.10
05-28-93	47.50	48.69	49.70	53.10	57.04	64.50
05-29-93	48.20	48.79	49.70	53.10	55.48	61.80
05-30-93	47.50	47.88	48.60	47.90	51.33	55.90
06-25-93	53.50	54.39	55.10	55.10	57.56	66.40
06-26-93	51.90	54.18	56.30	51.60	55.14	59.20
06-27-93	53.50	54.73	55.90	54.30	56.32	58.30
06-28-93	52.30	53.53	55.10	50.10	52.74	55.50
06-29-93	51.90	52.83	53.90	51.20	52.31	54.30
08-14-93	55.10	56.83	57.90	55.10	58.46	62.20
08-15-93	55.50	56.43	57.50	57.50	58.42	59.20
08-16-93	55.10	55.60	55.90	56.30	57.13	57.90
08-17-93	54.70	54.98	55.50	56.30	56.72	57.50
08-18-93	54.30	55.55	57.10	55.90	57.59	59.60
08-19-93	54.70	56.92	59.20	55.50	58.33	61.40
08-20-93	55.90	57.40	58.80	56.70	59.25	61.40
08-21-93	56.70	57.18	57.90	58.30	59.23	60.50
08-22-93	56.30	57.08	57.90	57.50	58.87	60.50
08-23-93	55.90	57.06	58.80	57.10	58.91	61.80
08-24-93	54.70	55.72	56.70	52.70	54.82	57.10
08-25-93	52.70	54.20	55.50	49.30	52.55	54.70
08-26-93	52.30	54.22	56.30	50.80	52.98	55.50
08-27-93	53.50	54.55	55.90	52.70	53.98	55.90
08-28-93	51.90	53.38	55.10	50.10	52.05	53.90
08-29-93	51.60	53.35	55.10	49.70	52.00	54.30
08-30-93	51.90	53.63	55.50	50.10	52.47	54.70
08-31-93	52.30	53.60	54.30	50.80	52.76	54.70
09-01-93	52.70	54.20	55.90	51.90	54.13	55.90
09-02-93	53.50	55.10	57.10	52.70	54.62	56.70
09-03-93	53.90	55.68	57.50	53.10	55.69	58.80
09-04-93	54.70	56.37	57.90	54.70	56.59	58.80
09-05-93	54.30	56.35	57.90	53.90	56.00	57.50
09-06-93	54.70	56.18	57.50	53.90	55.80	57.90
09-07-93	54.70	56.55	57.90	53.90	56.15	58.30
09-08-93	54.70	56.85	58.30	54.30	56.69	59.60
09-09-93	55.10	56.98	58.30	54.70	56.93	59.20
09-10-93	55.50	57.24	58.80	55.10	57.37	60.50
09-11-93	54.70	55.95	57.50	54.70	55.75	57.90
09-12-93	53.50	54.70	55.90	52.70	53.68	54.70
09-13-93	51.90	53.73	55.10	49.30	51.68	53.10
09-14-93	52.30	53.05	54.30	50.40	51.23	51.90
09-15-93	51.90	52.82	53.90	50.10	51.21	51.90
09-16-93	50.40	51.90	53.50	47.20	49.14	51.20
09-17-93	50.10	51.83	53.50	46.80	48.80	50.80
09-18-93	50.10	51.82	53.50	46.80	48.94	50.80
09-19-93	50.80	51.95	53.10	47.90	49.26	50.40
09-20-93	50.40	51.21	51.90	47.90	48.50	49.30
09-21-93	50.10	50.83	51.90	47.50	48.29	49.30
09-22-93	48.60	50.16	51.90	44.40	46.49	48.60
09-23-93	48.60	50.29	51.90	44.70	46.64	48.60
09-24-93	49.00	50.41	51.90	45.10	47.19	49.00
09-25-93	48.60	50.15	51.60	45.40	47.33	49.30
09-26-93	48.60	50.18	51.90	45.10	47.21	49.70
09-27-93	49.00	50.63	51.90	45.80	48.40	51.20
09-28-93	49.70	51.16	52.70	47.90	49.65	52.30

Sullivan Creek Air & Water Temperatures at Powerhouse

<u>Date</u>	Water Min	Water Avg	Water Max	Air Min	Air Avg	Air Max
09-29-93	49.70	51.51	53.10	47.50	50.11	53.90
09-30-93	50.40	51.60	52.70	49.00	50.25	51.60
12-23-93	36.9	37.2	37.6	27.8	29.7	30.6
12-24-93	36.9	37.0	37.2	26.5	29.2	30.9
12-25-93	36.0	36.5	36.9	21.9	25.9	28.3
12-26-93	36.3	36.7	36.9	26.5	28.1	29.2
12-27-93	36.3	36.7	36.9	26.0	28.3	29.7
12-28-93	36.0	36.4	36.9	27.3	28.4	29.2
12-29-93	35.7	36.4	36.6	27.8	29.8	31.2
12-30-93	36.0	36.4	36.9	31.1	31.8	32.5
12-31-93	36.0	36.4	36.6	32.1	32.4	32.5
01-01-94	35.1	36.0	36.3	32.0	32.4	33.0
01-02-94	36.0	36.2	36.3	32.4	32.9	33.6
01-03-94	35.4	36.0	36.3	32.4	33.1	34.2
01-04-94	35.7	36.0	36.3	32.4	32.7	33.6
01-05-94	35.7	36.0	36.3	32.0	33.1	34.2
01-06-94	34.2	34.9	35.7	25.2	28.2	31.8
01-07-94	34.2	35.1	35.7	27.2	30.3	32.0
01-08-94	34.5	35.4	36.0	31.5	32.0	32.5
01-09-94	35.7	35.9	36.3	32.0	32.7	34.1
01-10-94	35.4	35.7	36.0	32.0	32.5	33.0
01-11-94	35.4	35.9	36.3	32.0	33.3	34.6
01-12-94	36.0	36.1	36.3	33.3	33.9	34.6
01-13-94	36.0	36.2	36.6	33.0	33.6	34.2
01-14-94	36.3	36.5	36.9	33.6	33.9	35.1
01-15-94	36.3	36.5	36.9	33.0	33.9	35.4
01-16-94	36.0	36.5	36.9	32.5	33.9	35.1
01-17-94	36.0	36.4	36.9	32.5	33.5	34.6
01-18-94	36.0	36.4	37.2	32.0	33.2	35.1
01-19-94	35.1	35.9	36.6	28.7	31.7	33.3
01-20-94	34.2	34.8	35.1	25.6	28.1	30.3
01-21-94	34.2	34.9	36.0	25.6	28.6	31.6
01-22-94	35.1	35.8	36.6	29.6	31.7	33.3
01-23-94	35.7	36.0	36.6	31.5	32.5	33.6
01-24-94	36.0	36.5	37.2	32.4	33.1	34.8
01-25-94	35.7	36.2	36.9	31.5	32.3	34.1
01-26-94	36.0	36.6	36.9	32.5	33.4	34.2
01-27-94	35.7	36.4	36.6	30.6	32.5	33.6
01-28-94	34.5	35.3	36.0	26.5	29.2	31.6
01-29-94	35.1	35.7	36.3	28.7	30.8	32.5
01-30-94	28.6	32.2	35.7	26.0	27.6	30.3
01-31-94	27.5	30.1	33.0	23.5	26.0	29.2
02-01-94	29.7	31.8	34.2	23.1	25.9	29.6
02-02-94	30.6	31.7	33.6	21.1	25.3	28.7
02-03-94	28.9	30.3	31.8	17.3	22.7	26.6
02-04-94	31.8	32.8	33.9	23.9	26.3	28.6
02-05-94	33.0	33.5	34.2	26.9	27.7	29.5
02-06-94	32.1	32.7	33.3	24.3	27.3	29.2
02-07-94	23.3	28.3	31.8	10.4	18.7	23.1
02-08-94	23.3	30.4	31.8	3.7	11.9	19.9
02-09-94	31.5	31.7	31.8	17.7	20.5	23.1
02-10-94	31.5	31.6	31.8	21.1	23.1	25.2
02-11-94	31.2	31.4	31.5	22.7	24.8	26.9
02-12-94	31.5	32.1	32.7	26.5	28.6	30.1
02-13-94	32.7	32.9	33.3	29.6	30.9	31.6
02-14-94	32.7	33.0	33.3	28.7	30.7	31.6
02-15-94	33.0	33.2	33.3	31.1	31.8	32.5
02-17-94	35.4	35.6	36.0	32.1	32.1	32.1
02-18-94	35.1	35.7	36.6	32.1	32.8	34.2
02-19-94	34.8	35.4	36.3	30.3	32.0	32.7
02-20-94	34.2	35.3	36.6	30.0	31.7	33.9

Sullivan Creek Air & Water Temperatures at Powerhouse

<u>Date</u>	Water Min	Water Avg	Water Max	Air Min	Air Avg	Air Max
02-21-94	34.5	35.5	36.9	32.1	32.8	34.5
02-22-94	34.5	35.4	36.6	30.6	32.0	32.4
02-23-94	33.6	35.0	35.7	24.4	31.2	33.0
02-24-94	32.1	32.3	33.3	16.0	21.0	24.9
02-25-94	32.1	32.2	32.4	20.8	24.2	27.2
02-26-94	32.7	34.3	35.7	26.9	29.1	31.2
02-27-94	34.5	35.5	36.3	30.6	31.7	32.7
02-28-94	34.8	35.5	36.0	32.1	32.3	33.0
03-01-94	35.7	36.1	36.6	32.4	32.7	33.3
03-02-94	36.0	36.4	37.2	32.4	33.3	34.8
03-03-94	36.0	36.6	37.6	32.7	33.9	35.4
03-04-94	35.7	36.5	37.6	32.1	34.3	37.6
03-05-94	35.1	35.7	36.6	28.3	30.9	35.7
03-06-94	33.9	35.0	36.0	23.8	28.1	34.2
03-07-94	33.9	35.3	36.9	24.4	28.6	33.6
03-08-94	33.3	34.6	36.0	23.8	28.6	36.0
03-09-94	33.6	35.0	36.9	25.8	30.3	36.0
03-10-94	35.4	36.5	38.2	31.2	34.1	38.8
03-11-94	35.7	36.7	38.2	32.1	33.9	38.8
03-12-94	35.4	36.8	38.8	30.6	33.4	38.5
03-13-94	36.6	37.4	38.5	33.0	34.7	39.5
03-14-94	36.6	37.8	39.8	32.7	35.0	40.1
03-15-94	36.0	37.5	39.5	31.5	35.1	43.7
03-16-94	36.9	38.0	39.8	32.7	36.4	43.4
03-17-94	37.2	38.2	39.5	34.5	36.5	40.7
03-18-94	37.6	38.3	39.5	34.2	36.2	39.5
03-19-94	36.6	37.5	38.8	31.5	33.2	36.9
03-20-94	36.0	37.0	38.2	29.7	32.6	35.4
03-21-94	36.6	37.4	38.8	31.8	34.5	39.8
03-22-94	35.7	36.8	38.2	28.3	32.1	37.9
03-23-94	35.1	36.4	38.2	25.5	30.9	38.8
03-24-94	35.1	36.5	38.5	26.3	31.9	43.0
03-25-94	35.4	36.9	39.1	27.7	32.9	43.0
03-26-94	36.0	37.7	40.1	30.3	35.2	46.1
03-27-94	36.6	38.3	40.7	31.5	36.4	46.5
03-28-94	37.2	38.9	41.4	32.7	37.9	48.2
03-29-94	37.2	39.1	41.4	32.1	37.3	48.2
03-30-94	37.9	39.5	42.1	32.7	38.3	49.3
03-31-94	38.5	39.8	42.1	33.0	39.0	50.1
04-14-94	39.8	40.6	41.7	37.3	39.3	40.8
04-15-94	40.4	41.6	43.0	38.4	41.4	44.6
04-16-94	41.4	42.7	44.1	41.4	44.5	48.7
04-17-94	42.4	43.3	44.1	43.3	46.2	49.5
04-18-94	42.4	43.1	43.7	43.3	45.9	48.0
04-19-94	41.7	42.2	42.7	43.7	45.0	46.6
04-20-94	40.4	41.4	42.1	42.0	43.5	45.2
04-21-94	40.4	41.3	42.1	41.4	43.3	45.4
04-22-94	40.4	41.0	41.7	40.7	42.2	43.4
04-23-94	40.4	41.1	42.1	40.1	42.0	43.9
04-24-94	40.4	40.8	41.4	40.1	41.5	42.6
04-25-94	40.4	41.0	41.4	41.4	42.3	43.4
04-26-94	40.1	41.2	42.1	36.3	41.4	45.9
04-27-94	40.4	41.3	42.1	35.7	41.5	46.6
04-28-94	41.1	42.1	43.0	39.1	43.2	48.7
04-29-94	41.1	42.3	43.4	35.1	42.3	50.2
04-30-94	42.1	42.2	42.7	39.5	42.9	45.2
05-01-94	41.1	41.6	41.7	39.1	41.5	43.3
05-02-94	40.7	41.5	42.1	37.9	41.8	45.2
05-03-94	40.7	41.9	43.0	36.6	43.3	51.7
05-04-94	42.1	42.3	42.4	43.0	44.1	45.2
05-05-94	41.7	42.8	44.1	39.5	44.9	50.2
05-06-94	42.7	44.0	45.1	41.1	46.5	52.5
05-07-94	43.7	45.0	46.1	44.4	49.4	57.6

Sullivan Creek Air & Water Temperatures at Powerhouse

<u>Date</u>	Water <u>Min</u>	Water <u>Avg</u>	Water <u>Max</u>	Air <u>Min</u>	Air <u>Avg</u>	Air <u>Max</u>
05-08-94	44.1	45.2	45.8	45.2	49.2	53.3
05-09-94	43.7	44.7	45.4	44.4	49.0	55.0
05-10-94	43.4	44.4	45.1	45.9	49.2	55.9
05-11-94	43.4	44.1	44.7	44.6	47.3	49.5
05-12-94	43.4	44.3	45.1	45.8	47.4	49.7
05-13-94	43.0	43.8	44.4	43.3	45.5	47.3
05-14-94	42.7	43.5	44.1	40.1	44.7	47.3
05-15-94	43.0	43.4	43.7	44.4	45.2	46.8
05-16-94	42.7	43.2	43.7	43.3	45.4	49.5
05-17-94	42.4	43.3	44.4	38.2	44.0	48.7
05-18-94	43.7	44.3	45.4	45.1	46.7	49.5
05-19-94	43.7	44.2	44.7	41.7	45.1	47.3
05-20-94	43.7	44.2	44.7	45.1	46.2	48.7
05-21-94	44.1	44.5	45.1	45.1	46.6	48.7
05-22-94	43.7	44.9	45.8	41.7	46.3	50.1
05-23-94	44.7	46.0	47.2	43.0	48.0	52.7
05-24-94	45.8	47.2	48.2	45.8	50.1	54.7
05-25-94	46.8	48.2	49.0	47.5	51.9	59.5
05-26-94	47.5	48.1	48.6	49.0	51.6	55.0
05-27-94	46.8	47.6	48.2	46.8	49.5	51.7
05-28-94	45.8	46.5	46.8	44.1	47.4	49.5
05-29-94	45.4	45.8	46.5	44.4	46.4	48.0
05-30-94	44.4	45.5	46.8	39.5	45.0	49.7
05-31-94	44.4	45.8	46.8	40.7	46.5	51.0
06-01-94	46.1	46.6	47.2	47.9	49.4	51.2
06-02-94	45.8	47.6	48.6	42.1	49.9	57.6
06-03-94	47.2	49.6	51.2	46.5	53.8	60.0
06-04-94	47.2	48.6	49.3	44.1	49.6	51.9
06-05-94	46.8	48.4	49.0	44.7	50.8	53.9
06-06-94	46.5	47.6	48.2	43.7	48.2	50.4
06-07-94	46.1	46.8	47.9	44.4	46.6	49.0
06-08-94	45.8	46.6	47.5	44.1	47.4	51.0
06-09-94	46.5	47.1	47.9	45.4	48.7	52.3
06-10-94	47.2	48.0	48.6	48.0	50.6	53.5
06-11-94	48.2	48.9	50.1	49.5	51.9	55.9
06-12-94	48.6	49.2	49.7	50.2	52.2	56.3
06-13-94	47.9	49.2	50.8	42.1	48.5	54.7
06-14-94	47.5	48.5	49.7	45.2	47.7	51.2
06-15-94	47.5	48.3	49.3	45.2	48.5	52.5
06-16-94	48.2	49.4	50.8	47.9	49.7	53.3
06-17-94	50.1	51.2	52.3	45.8	51.2	59.5
06-18-94	50.1	51.1	52.3	44.7	49.5	54.7
06-19-94	51.6	52.7	53.9	45.9	52.3	58.8
06-20-94	53.1	54.1	55.5	50.8	56.3	61.4
06-21-94	54.7	55.9	57.1	53.3	59.1	65.6
06-22-94	55.9	57.0	57.9	56.3	60.9	66.4
06-23-94	55.9	57.4	58.8	50.8	59.8	68.4
06-25-94	55.1	56.9	57.9	50.1	59.1	64.5
06-26-94	53.9	55.3	56.3	50.4	54.8	58.5
06-27-94	53.5	55.3	56.7	49.7	56.3	63.5
06-28-94	53.9	56.4	58.8	49.7	59.5	69.4
06-29-94	55.5	57.3	58.8	53.9	60.4	65.6
06-30-94	57.9	57.9	57.9	60.5	61.0	61.4
06-30-94	55.5	57.8	58.8	55.5	61.3	65.5
07-01-94	56.3	57.3	57.9	56.3	59.9	63.5
07-02-94	55.1	56.3	57.5	51.2	54.8	59.5
07-03-94	54.3	55.6	56.3	50.1	54.4	57.6
07-04-94	53.9	55.4	57.1	48.6	54.7	58.5
07-05-94	53.9	56.1	58.3	49.3	57.0	66.7
07-06-94	55.5	57.1	59.2	53.9	59.8	67.9
07-07-94	56.3	57.8	60.5	54.7	58.9	66.7
07-09-94	57.1	59.2	61.4	53.9	63.1	77.0
07-10-94	56.7	59.3	61.8	51.9	61.5	72.8

Sullivan Creek Air & Water Temperatures at Powerhouse

<u>Date</u>	Water <u>Min</u>	Water <u>Avg</u>	Water <u>Max</u>	Air <u>Min</u>	Air <u>Avg</u>	Air <u>Max</u>
07-11-94	57.1	59.6	62.7	51.9	62.3	75.5
07-12-94	57.1	59.6	62.2	52.7	62.2	74.1
07-13-94	57.5	60.0	62.7	53.9	62.3	71.5
07-14-94	58.8	60.3	63.2	60.0	63.4	72.1
07-15-94	57.9	60.4	62.7	53.5	62.2	70.5
07-16-94	58.3	60.7	63.6	55.9	63.4	72.8
07-17-94	59.2	61.1	63.2	56.7	64.6	72.8
07-18-94	59.6	61.0	62.7	59.2	65.3	74.1
07-19-94	57.9	60.6	63.6	52.5	62.5	74.1
07-20-94	58.8	61.6	64.5	55.5	65.2	78.4
07-21-94	60.0	63.0	66.0	58.8	67.7	79.0
07-22-94	60.9	63.7	66.4	60.5	68.9	80.0
07-23-94	62.2	64.4	67.4	62.2	69.8	80.0
07-24-94	62.7	64.9	67.4	63.2	70.6	81.6
07-26-94	63.2	65.3	67.4	63.6	71.0	80.0
07-27-94	62.2	64.6	66.9	60.0	67.9	77.0
07-28-94	61.8	63.5	65.5	58.8	64.9	70.3
07-29-94	60.5	63.4	66.4	57.1	66.9	81.6
07-30-94	61.8	63.9	66.0	60.9	69.3	81.6
07-31-94	60.9	63.4	66.0	58.3	66.9	77.0
08-01-94	60.9	63.6	66.4	58.3	67.1	80.0
08-02-94	62.2	64.5	67.4	62.7	69.2	77.1
08-04-94	62.7	65.1	67.4	62.4	68.8	77.0
08-05-94	62.7	64.6	66.4	60.0	68.2	77.0
08-06-94	61.4	63.5	65.5	56.3	65.1	75.5
08-07-94	60.5	63.1	66.0	54.7	63.7	75.5
08-08-94	61.8	62.9	63.6	59.5	63.8	70.3
08-09-94	59.6	61.7	63.6	52.5	60.8	71.5
08-10-94	58.8	61.6	64.5	50.8	60.7	72.8
08-11-94	59.2	62.3	65.0	53.9	63.9	74.3
08-12-94	59.6	62.6	65.5	56.3	65.1	74.8
08-13-94	60.5	63.5	66.4	58.8	67.2	77.1
08-14-94	61.4	63.7	66.9	59.2	67.6	78.4
08-15-94	61.4	63.4	65.0	61.4	68.4	75.5
08-16-94	60.5	62.9	65.5	56.7	66.2	77.0
08-17-94	60.0	62.3	64.1	56.7	63.7	70.3
08-18-94	59.2	61.9	65.0	54.3	62.8	74.1
08-19-94	59.6	62.2	65.0	56.7	64.3	73.2
08-20-94	60.0	62.3	64.5	58.3	65.9	77.0
08-21-94	59.6	61.8	63.6	55.5	64.3	72.8
08-22-94	59.2	60.9	62.2	54.3	60.8	65.0
08-23-94	58.3	60.2	62.2	51.9	59.8	69.0
08-24-94	57.5	59.7	61.8	50.8	59.3	67.9
08-25-94	57.9	59.8	61.4	52.3	60.2	65.0
08-26-94	57.9	59.0	60.0	53.9	58.5	63.2
08-27-94	55.5	58.3	61.4	46.5	55.5	66.9
08-28-94	56.7	58.8	61.4	49.3	57.8	66.9
08-29-94	57.5	59.3	60.9	53.1	58.9	63.6
08-30-94	57.1	59.1	61.4	50.4	57.5	64.5
08-31-94	57.1	59.6	61.8	52.3	60.5	72.1
09-01-94	56.7	59.3	61.8	50.4	59.6	72.1
09-02-94	57.5	59.5	61.8	53.1	61.3	73.2
09-03-94	57.5	58.2	60.0	51.2	56.0	60.4
09-04-94	55.9	57.6	59.6	48.2	52.9	58.8
09-05-94	55.1	57.3	59.6	46.5	52.7	60.9
09-06-94	55.5	57.8	60.0	48.6	55.3	64.1
09-07-94	56.3	58.2	60.0	49.3	57.0	64.5
09-08-94	57.1	58.9	60.5	54.3	60.4	67.9
09-09-94	56.7	57.8	59.2	50.4	56.3	61.4
09-10-94	55.1	56.2	57.5	46.5	50.8	56.3
09-11-94	54.3	55.9	57.5	46.1	50.9	58.3
09-12-94	53.1	55.1	57.1	42.1	48.9	57.5

Sullivan Creek Air & Water Temperatures at Powerhouse

<u>Date</u>	<u>Water Min</u>	<u>Water Avg</u>	<u>Water Max</u>	<u>Air Min</u>	<u>Air Avg</u>	<u>Air Max</u>
09-13-94	53.1	55.2	57.5	43.4	50.2	57.9
09-14-94	55.1	56.3	57.5	51.9	54.8	59.2
09-15-94	55.5	56.7	57.9	53.9	57.1	62.2
09-16-94	55.1	56.6	58.3	50.1	55.4	62.7
09-17-94	55.5	57.2	58.8	51.2	56.9	64.1
09-18-94	55.5	57.1	58.8	50.8	56.6	64.1
09-19-94	55.1	56.1	57.5	50.4	52.6	55.5
09-20-94	55.5	57.3	58.8	54.2	58.3	62.4
09-21-94	54.3	56.0	57.5	49.5	54.1	59.5
09-22-94	53.9	55.9	57.5	48.0	53.5	59.5
09-23-94	53.9	56.0	57.9	48.7	54.3	60.4
09-24-94	54.3	56.1	57.9	51.0	55.5	61.4
09-25-94	54.3	56.1	57.9	51.0	55.6	61.4
09-26-94	53.9	55.9	57.5	51.0	55.2	60.4
09-27-94	53.9	55.8	57.5	51.0	55.6	61.4
09-28-94	54.3	56.1	57.9	51.0	55.3	58.5
09-29-94	54.3	55.7	57.1	51.7	56.2	65.6
09-30-94	55.1	56.0	57.1	53.3	56.6	59.5
10-01-94	54.3	55.3	56.3	51.7	54.2	57.6
10-02-94	51.9	53.5	54.7	43.9	47.7	52.5
10-03-94	51.6	53.0	54.3	43.9	47.8	53.3
10-04-94	51.6	52.7	53.9	41.4	45.5	51.0
10-05-94	51.2	52.6	53.9	38.4	45.2	51.0
10-06-94	51.2	52.5	53.5	42.0	46.1	51.0
10-07-94	50.8	52.5	53.5	40.2	45.7	51.0
10-08-94	52.3	53.5	54.7	42.0	46.1	51.7
10-09-94	53.1	54.3	55.5	43.3	47.7	52.5
10-10-94	54.3	55.1	55.5	48.7	51.3	55.0
10-11-94	54.7	55.3	55.9	47.5	50.9	55.1
10-12-94	53.9	54.8	55.9	42.4	46.2	49.3
10-13-94	53.5	54.3	55.1	40.1	44.8	49.3
10-14-94	53.9	54.2	54.7	44.1	45.5	47.2
10-15-94	53.5	53.8	54.3	42.4	44.3	47.2
10-16-94	52.7	53.3	53.9	39.1	42.5	47.2
10-17-94	52.7	53.0	53.5	38.5	42.7	46.8
10-18-94	52.3	52.7	53.1	40.7	43.1	46.1
10-19-94	51.9	52.3	52.7	38.5	41.3	44.1
10-20-94	52.3	52.5	52.7	43.0	44.3	45.8
10-21-94	51.9	52.3	52.7	41.1	43.7	45.8
10-22-94	51.2	51.5	51.9	36.0	40.0	42.7
10-23-94	51.2	51.5	51.9	40.7	43.3	45.8
10-24-94	50.4	50.9	51.2	38.2	40.1	43.4
10-25-94	50.4	50.8	51.2	38.2	40.6	44.4
10-26-94	50.8	51.4	51.6	42.1	45.4	47.9
10-27-94	50.8	51.2	51.6	44.4	45.5	46.5
10-28-94	50.1	50.5	50.8	40.4	42.7	44.4
10-29-94	49.3	49.6	50.1	37.6	40.2	41.7
10-30-94	48.6	49.0	49.0	37.2	38.8	40.4
10-31-94	47.9	48.3	48.6	37.9	39.2	40.1
11-01-94	47.9	48.1	48.2	36.3	39.0	39.8
11-02-94	46.8	47.4	47.5	33.6	36.5	38.2
11-03-94	46.1	46.4	46.8	30.6	33.9	37.6
11-04-94	45.4	45.8	46.1	35.7	36.2	37.3
11-05-94	45.1	45.5	45.8	30.6	34.0	36.2
11-06-94	44.7	44.9	45.1	29.6	33.3	36.2
11-07-94	44.7	45.0	45.4	35.1	36.3	36.7
11-08-94	45.1	45.2	45.4	36.2	36.8	37.3
11-09-94	44.7	44.7	44.7	36.2	37.0	37.3
11-10-94	44.7	44.7	44.7	36.7	37.3	37.9
11-11-94	44.4	44.5	44.7	36.7	37.5	37.9
11-12-94	44.1	44.3	44.7	35.7	37.7	39.0
11-13-94	43.4	43.6	43.7	31.1	33.7	35.1
11-14-94	43.4	43.5	43.7	35.1	35.9	36.7
11-15-94	43.0	43.3	43.4	35.7	36.2	36.7

Sullivan Creek Air & Water Temperatures at Powerhouse

<u>Date</u>	Water <u>Min</u>	Water <u>Avg</u>	Water <u>Max</u>	Air <u>Min</u>	Air <u>Avg</u>	Air <u>Max</u>
11-16-94	42.7	42.8	43.0	35.7	36.0	36.2
11-17-94	41.7	42.3	42.7	29.6	34.1	35.7
11-18-94	41.4	41.6	41.7	28.7	30.2	31.6
11-19-94	41.1	41.3	41.4	31.6	32.2	33.0
11-20-94	40.4	41.0	41.4	28.2	31.9	33.6
11-21-94	39.1	39.7	40.1	22.7	24.9	26.9
11-22-94	38.8	39.3	39.8	21.9	25.2	28.7
11-23-94	39.1	39.5	39.8	26.0	29.3	31.1
11-24-94	39.8	40.0	40.4	31.1	32.0	32.5
11-25-94	39.5	39.8	40.1	32.5	33.1	34.1
11-26-94	39.1	39.9	40.4	31.1	32.9	33.6
11-27-94	39.1	39.4	39.5	30.6	31.7	32.5
11-28-94	38.5	38.9	39.1	29.2	30.8	32.0
11-29-94	37.6	38.3	38.5	28.7	30.8	32.5
11-30-94	38.5	38.8	39.1	32.5	33.0	34.1
12-01-94	38.2	38.6	39.1	32.0	32.9	34.1
12-02-94	38.5	38.5	38.5	33.0	33.0	33.0
12-06-94	33.6	34.7	35.4	14.4	19.4	23.1
12-07-94	35.1	35.5	36.0	21.5	24.2	26.0
12-08-94	34.8	35.4	35.7	24.3	25.9	28.2
12-09-94	34.8	35.6	36.0	26.9	27.8	28.7
12-10-94	34.8	35.4	36.0	25.2	27.0	28.2
12-11-94	35.4	35.9	36.3	27.8	29.0	30.6
12-12-94	35.4	35.8	36.6	26.0	28.6	30.6
12-13-94	33.6	34.6	35.1	18.0	23.5	26.5
12-14-94	34.5	35.1	35.7	25.2	26.6	27.8
12-15-94	34.8	35.4	36.0	27.8	29.0	30.6
12-16-94	34.5	35.7	36.6	30.1	30.8	31.6
12-17-94	35.4	36.1	36.3	31.6	31.8	32.0
12-18-94	36.3	36.4	36.6	32.0	32.4	32.5
12-19-94	36.3	36.4	36.6	32.5	32.9	33.0
12-20-94	36.3	36.5	36.9	32.5	32.8	33.0
12-21-94	36.3	36.5	36.6	32.0	32.6	33.0
12-22-94	36.0	36.5	36.9	31.6	32.4	33.0
12-23-94	35.7	36.2	36.9	30.6	31.5	32.5
12-24-94	34.8	35.4	36.0	26.5	29.1	31.1
12-25-94	35.7	36.1	36.6	30.1	31.9	33.6
12-26-94	35.1	35.8	36.3	32.0	32.1	32.5
12-27-94	35.7	36.2	36.6	32.0	32.1	32.5
12-28-94	36.3	36.4	36.9	32.0	32.7	33.6
12-29-94	34.5	35.5	36.3	25.2	29.5	32.5
12-30-94	32.4	33.5	34.5	19.1	22.3	26.0
12-31-94	32.1	32.1	32.4	15.1	17.7	20.7
01-01-95	32.1	32.1	32.1	10.8	15.3	18.4
01-02-95	32.1	32.1	32.1	10.4	15.0	18.8
01-03-95	31.8	32.1	32.1	12.1	14.4	17.7
01-04-95	28.9	30.5	31.8	9.2	12.4	15.8
01-05-95	27.7	28.0	28.9	8.5	12.4	16.2
01-06-95	27.5	27.8	28.3	11.4	15.5	19.1
01-07-95	27.7	28.0	28.6	12.7	16.7	20.7
01-08-95	28.6	29.4	30.0	20.7	22.8	24.7
01-09-95	30.3	30.7	31.2	24.7	27.6	30.1
01-10-95	31.2	31.6	33.6	29.6	31.1	32.0
01-11-95	33.6	34.3	34.8	32.0	32.0	32.5
01-12-95	33.9	34.8	35.1	32.0	32.1	32.5
01-13-95	34.5	35.0	35.1	32.0	32.2	32.5
01-14-95	34.8	35.1	35.4	32.0	32.3	33.0
01-15-95	35.1	35.4	36.0	32.0	32.6	33.6
01-16-95	35.4	35.6	36.3	32.0	32.4	33.0
01-17-95	35.4	35.6	36.0	32.0	32.3	33.0
01-18-95	35.1	35.4	35.7	32.0	32.2	32.5
01-19-95	34.8	35.8	36.3	32.0	32.4	33.0
01-20-95	34.2	35.0	36.0	26.9	29.4	32.0
01-21-95	33.6	33.9	34.2	23.1	25.8	27.8

Sullivan Creek Air & Water Temperatures at Powerhouse

<u>Date</u>	Water Min	Water Avg	Water Max	Air Min	Air Avg	Air Max
01-22-95	33.0	33.6	33.9	21.1	24.4	26.9
01-23-95	32.1	32.4	33.0	15.8	19.7	23.9
01-24-95	32.1	32.6	33.6	14.8	20.3	25.2
01-25-95	33.9	34.4	35.1	25.2	27.2	28.7
01-26-95	34.5	35.1	35.7	28.7	29.8	30.6
01-27-95	35.1	35.4	36.0	30.6	31.1	31.6
01-28-95	34.8	35.4	36.0	31.1	31.6	32.0
01-29-95	34.8	35.2	35.4	31.1	31.6	32.0
01-30-95	35.4	35.8	36.0	32.0	32.0	32.5
01-31-95	35.7	35.9	36.3	32.0	32.3	32.5
02-01-95	35.7	35.9	36.6	32.0	32.7	34.1
02-02-95	35.7	36.0	36.3	32.5	32.8	33.6
02-03-95	35.4	36.1	36.9	31.6	32.6	33.0
02-04-95	34.8	35.5	36.0	29.2	31.1	32.0
02-05-95	35.4	35.8	36.3	31.1	31.9	32.5
02-06-95	36.0	36.3	36.9	32.0	32.4	33.0
02-07-95	36.0	36.3	36.6	32.0	32.5	33.6
02-08-95	35.4	35.8	36.3	30.6	31.5	32.0
02-09-95	35.1	35.6	36.3	27.3	30.1	32.5
02-10-95	34.5	35.4	36.3	25.6	28.8	31.6
02-11-95	34.2	35.4	35.7	25.6	29.4	30.6
02-12-95	32.1	32.6	34.2	18.0	20.4	24.7
02-13-95	32.1	32.2	32.7	14.4	17.7	20.7
02-14-95	32.1	32.2	32.7	8.5	15.5	21.9
02-15-95	32.4	33.1	33.9	18.8	21.2	24.3
02-16-95	33.9	34.5	35.1	24.3	27.3	31.1
02-17-95	34.2	35.1	35.7	31.1	32.0	33.0
02-18-95	35.1	35.4	35.7	32.0	32.5	33.0
02-19-95	35.4	35.8	36.3	32.5	33.0	34.1
02-20-95	35.7	35.9	36.6	32.5	33.7	35.7
02-21-95	35.4	35.8	36.3	32.5	33.3	35.1
02-22-95	35.4	35.7	36.0	31.6	32.6	34.6
02-23-95	35.1	35.6	36.0	28.7	31.4	34.6
02-24-95	35.4	36.1	36.9	31.1	32.7	35.7
02-25-95	36.0	36.5	36.9	32.5	33.6	36.7
02-26-95	35.7	36.2	36.6	28.7	31.3	35.7
02-27-95	34.8	35.5	36.0	22.7	27.4	33.0
02-28-95	34.2	35.0	35.7	18.8	25.1	32.5
03-01-95	33.9	34.8	35.4	19.1	24.5	32.5
03-02-95	33.6	34.6	35.4	16.9	23.8	32.5
03-03-95	33.9	35.1	36.3	19.1	25.6	32.0
03-04-95	35.4	35.9	36.3	29.6	30.8	31.6
03-05-95	35.1	35.8	36.6	25.2	30.0	33.0
03-06-95	33.9	34.9	35.7	16.6	24.2	28.7
03-07-95	34.8	35.6	36.6	26.0	28.9	33.0
03-08-95	35.1	35.5	35.7	28.7	30.5	32.5
03-09-95	35.7	36.2	36.6	31.6	32.2	33.0
03-10-95	36.0	36.6	37.2	32.5	34.0	36.2
03-11-95	36.3	36.6	36.9	33.6	34.9	37.3
03-12-95	36.3	36.6	36.9	33.0	34.1	36.2
03-13-95	36.6	36.9	37.2	32.5	33.5	34.6
03-14-95	36.9	37.5	37.9	33.6	34.5	35.7
03-15-95	37.6	37.8	38.2	34.6	35.3	37.9
03-16-95	37.6	38.0	38.5	33.0	35.0	39.0
03-17-95	37.6	38.2	38.8	30.6	33.6	39.0
03-18-95	38.2	38.5	38.8	33.6	34.9	36.2
03-19-95	38.5	38.8	39.1	34.6	36.2	39.6
03-20-95	38.5	38.8	39.1	33.6	35.2	36.2
03-21-95	38.5	38.9	39.1	33.6	35.5	37.9
03-22-95	37.9	38.6	39.5	32.0	34.3	36.7
03-23-95	38.2	38.6	39.1	33.6	35.2	38.4
03-24-95	38.2	38.5	39.1	32.0	35.0	37.9
03-25-95	37.2	38.2	38.8	29.6	32.0	35.1
03-26-95	36.9	38.2	39.5	29.2	32.7	39.6

Sullivan Creek Air & Water Temperatures at Powerhouse

<u>Date</u>	Water Min	Water Avg	Water Max	Air Min	Air Avg	Air Max
03-27-95	37.2	38.7	39.8	30.6	34.8	42.6
03-28-95	37.9	39.0	40.4	31.6	35.7	43.3
03-29-95	38.2	39.3	40.7	31.6	36.0	44.6
03-30-95	38.5	39.8	41.1	33.0	37.8	46.6
03-31-95	38.8	40.2	41.7	33.0	38.6	45.9
04-01-95	39.8	40.7	41.7	36.7	40.4	48.7
04-02-95	39.5	40.2	41.1	33.6	37.9	43.3
04-03-95	39.1	40.4	41.7	33.6	38.6	45.2
04-04-95	39.8	40.7	42.1	35.7	41.0	49.5
04-05-95	39.5	40.6	41.7	33.0	39.3	47.3
04-06-95	40.1	40.8	41.7	37.3	40.2	45.2
04-07-95	39.8	40.5	41.4	35.1	39.1	42.6
04-08-95	40.1	40.7	41.4	35.1	39.2	42.6
04-09-95	39.8	40.4	41.4	34.6	37.8	44.6
04-10-95	39.1	40.3	41.7	32.5	37.8	43.9
04-11-95	40.4	41.0	42.4	34.6	40.4	48.0
04-12-95	39.8	40.5	41.4	33.6	37.1	40.8
04-13-95	40.4	40.8	41.7	36.7	39.8	43.3
04-14-95	39.8	40.6	42.1	35.1	37.2	42.6
04-15-95	40.1	40.6	41.7	33.6	37.5	43.9
04-16-95	39.5	40.6	41.7	32.0	37.0	46.6
04-17-95	39.5	40.6	41.7	33.0	38.0	42.6
04-18-95	40.4	41.1	42.1	37.3	41.1	48.7
04-19-95	40.4	41.1	41.7	35.1	40.0	44.6
04-20-95	39.5	40.8	42.1	33.0	37.9	43.9
04-21-95	39.8	41.2	42.7	33.6	39.3	46.6
04-22-95	40.1	41.8	43.7	34.6	41.3	51.0
04-23-95	40.7	42.6	44.4	34.6	42.6	52.5
04-24-95	42.4	43.4	44.4	39.6	44.3	50.2
04-25-95	42.4	43.9	45.8	38.4	44.8	51.7
04-26-95	43.0	44.0	44.7	41.7	45.5	50.1
04-27-95	42.7	44.1	45.8	38.8	44.5	52.3
04-28-95	42.7	44.0	45.4	38.8	44.5	50.1
04-29-95	42.4	43.8	45.8	36.6	43.4	52.3
04-30-95	42.1	43.4	44.7	33.9	41.4	50.1
05-01-95	42.1	43.7	45.4	36.3	44.6	55.1
05-02-95	43.4	43.6	44.1	44.4	45.4	46.5
05-03-95	43.0	43.4	44.1	43.0	45.0	47.5
05-04-95	42.4	43.2	44.1	39.1	44.2	50.8
05-05-95	43.0	43.4	44.1	44.1	45.8	47.9
05-06-95	43.0	43.4	43.7	44.1	46.5	50.1
05-07-95	42.7	43.2	43.7	44.7	46.5	49.0
05-08-95	42.4	43.3	44.1	43.7	46.7	52.7
05-09-95	42.4	43.2	43.7	44.1	46.7	50.4
05-10-95	42.4	43.0	43.4	44.7	47.2	51.9
05-11-95	42.4	42.6	43.0	43.7	44.8	46.1
05-12-95	41.7	42.0	42.4	43.0	43.7	44.4
05-13-95	40.7	42.2	43.4	38.2	44.0	49.3
05-14-95	41.7	43.0	44.1	39.5	45.6	51.6
05-15-95	43.0	43.9	44.7	45.1	48.1	52.7
05-16-95	42.4	43.5	44.1	42.7	46.6	51.2
05-17-95	42.7	43.1	43.7	45.1	46.6	49.3
05-18-95	42.1	42.8	43.4	43.0	44.9	46.8
05-19-95	41.7	42.6	43.4	36.9	42.5	50.8
05-20-95	41.7	42.9	43.7	38.8	43.6	47.5
05-21-95	42.4	43.3	44.1	39.8	43.9	47.5
05-22-95	42.4	43.5	44.4	39.1	44.2	48.6
05-23-95	42.7	43.9	44.7	41.4	46.0	50.8
05-24-95	43.4	44.1	44.7	43.4	46.7	49.3
05-25-95	43.4	44.2	44.7	45.8	47.1	49.7
05-26-95	42.7	43.9	44.7	38.8	44.4	49.0
05-27-95	43.0	44.5	45.8	42.1	46.7	50.8
05-28-95	44.1	45.5	46.8	44.7	48.8	53.1
05-29-95	44.7	46.2	47.2	46.8	50.3	54.7

Sullivan Creek Air & Water Temperatures at Powerhouse

<u>Date</u>	Water Min	Water Avg	Water Max	Air Min	Air Avg	Air Max
05-30-95	44.7	46.2	47.2	47.5	50.7	54.3
05-31-95	45.1	46.2	46.8	47.5	50.1	53.1
06-01-95	44.7	46.2	47.2	46.1	49.6	52.7
06-02-95	45.4	46.2	46.8	47.5	48.6	49.7
06-03-95	46.5	47.8	49.3	47.9	50.1	53.1
06-04-95	49.0	49.8	50.8	49.7	51.9	55.1
06-05-95	49.7	50.1	50.8	50.1	51.5	53.5
06-06-95	49.0	49.3	50.1	46.1	47.9	49.7
06-07-95	48.6	49.7	51.2	45.4	48.7	51.9
06-08-95	49.7	50.6	51.2	44.1	48.5	52.7
06-09-95	49.3	50.5	51.2	45.1	49.6	53.9
06-10-95	49.7	51.2	52.3	47.5	51.6	55.1
06-11-95	51.9	52.4	53.1	51.2	53.0	54.3
06-12-95	51.6	52.2	53.1	46.5	51.1	55.5
06-13-95	50.8	51.4	51.9	50.8	52.4	53.5
06-14-95	49.7	50.2	50.8	50.1	51.1	51.6
06-15-95	49.3	50.3	51.6	49.7	52.3	55.1
06-16-95	50.8	51.9	53.1	51.9	54.6	57.9
06-17-95	51.9	52.5	53.1	52.3	53.9	54.7
06-18-95	50.8	51.5	51.9	47.5	51.0	53.1
06-19-95	50.8	51.1	51.6	48.7	51.1	55.5
06-20-95	49.7	50.3	50.8	49.3	50.2	51.0
06-21-95	49.3	49.7	50.1	49.7	51.2	53.1
06-22-95	49.7	50.7	51.9	50.8	52.9	56.3
06-23-95	50.8	52.2	53.9	51.2	54.8	59.6
06-24-95	52.7	54.0	55.5	51.9	56.3	61.8
06-25-95	54.3	55.8	57.1	53.9	58.6	66.9
06-26-95	55.1	56.5	57.5	52.3	57.8	64.1
06-27-95	55.1	55.9	56.7	49.7	55.4	60.0
06-28-95	53.9	54.7	55.5	48.2	55.1	61.8
06-29-95	53.5	55.2	56.7	49.7	56.6	63.6
06-30-95	55.1	56.1	57.1	53.5	58.5	65.5
07-01-95	55.1	56.5	57.5	53.9	59.3	65.0
07-02-95	55.5	56.3	56.7	56.7	58.0	59.5
07-03-95	55.1	55.5	56.3	54.3	57.2	60.9
07-04-95	54.3	55.4	56.7	50.4	57.0	63.2
07-05-95	54.3	55.9	57.5	51.6	58.3	64.5
07-06-95	54.7	56.2	57.5	50.8	58.1	64.5
07-07-95	55.5	56.8	57.9	56.7	60.7	65.6
07-08-95	55.9	57.5	59.6	57.1	61.4	68.4
07-09-95	57.5	58.9	60.5	60.0	62.7	67.4
07-10-95	58.3	58.8	59.6	57.9	61.7	65.0
07-11-95	56.7	58.0	59.2	50.8	58.3	65.6
07-12-95	55.9	57.9	60.0	49.3	57.8	65.0
07-13-95	56.3	58.2	60.0	50.8	59.6	67.9
07-14-95	56.7	58.5	60.5	53.1	61.0	68.4
07-15-95	57.5	59.3	61.4	56.7	61.2	67.9
07-16-95	57.1	59.5	61.8	51.9	60.8	70.0
07-17-95	57.5	59.9	62.7	53.5	61.6	70.5
07-18-95	57.9	60.4	62.7	55.9	63.2	72.1
07-19-95	58.3	60.9	63.6	56.7	64.2	75.5
07-20-95	58.8	61.5	64.1	57.1	65.6	74.8
07-21-95	60.0	60.8	61.8	60.5	63.6	66.7
07-22-95	57.9	60.4	63.2	53.1	61.3	69.0
07-23-95	58.8	61.0	63.2	57.5	63.5	70.0
07-24-95	58.8	60.5	61.8	57.5	62.8	67.4
07-25-95	58.3	60.5	63.2	57.1	63.7	69.4
07-26-95	59.2	60.2	62.7	57.9	61.4	64.5
07-27-95	57.5	59.7	62.2	51.6	58.3	64.1
07-28-95	57.1	59.9	63.2	50.1	59.2	70.0
07-29-95	58.3	59.7	61.4	56.7	61.3	66.7
07-30-95	56.7	59.0	61.8	47.5	57.1	65.0
07-31-95	57.1	59.6	62.7	55.0	61.0	70.5

Sullivan Creek Air & Water Temperatures at Powerhouse

<u>Date</u>	Water <u>Min</u>	Water <u>Avg</u>	Water <u>Max</u>	Air <u>Min</u>	Air <u>Avg</u>	Air <u>Max</u>
08-01-95	57.5	60.0	62.7	53.1	61.8	69.0
08-02-95	58.3	60.4	62.7	56.7	62.5	66.9
08-03-95	58.8	60.7	63.2	55.9	62.3	68.9
08-04-95	58.8	61.2	64.1	55.5	63.7	74.3
08-05-95	60.0	62.1	64.5	57.5	66.4	79.0
08-06-95	59.6	61.0	62.7	57.1	61.9	67.9
08-07-95	58.8	59.5	60.5	55.9	59.2	61.4
08-08-95	57.5	58.5	60.0	53.1	56.7	60.4
08-09-95	55.9	58.3	61.4	46.8	55.8	64.5
08-10-95	56.3	58.5	61.4	48.6	57.0	66.0
08-11-95	57.9	58.9	60.0	55.9	59.0	64.5
08-12-95	56.3	57.4	58.8	48.6	55.3	62.4
08-13-95	55.5	56.7	58.8	47.2	52.6	57.9
08-14-95	55.1	56.7	58.3	47.9	53.6	58.8
08-15-95	55.5	57.2	59.2	52.3	56.3	60.9
08-16-95	55.9	56.9	57.9	52.3	55.6	58.8
08-17-95	55.1	56.0	57.1	48.2	52.5	55.0
08-18-95	54.7	55.9	57.1	49.0	53.7	59.5
08-19-95	54.3	56.1	57.9	48.6	54.3	60.0
08-20-95	54.3	56.5	59.2	49.3	55.9	65.5
08-21-95	55.1	57.4	60.5	48.2	58.1	71.5
08-22-95	55.5	57.8	60.0	51.6	59.0	68.4
08-23-95	55.5	57.4	58.8	47.9	56.3	64.5
08-24-95	55.1	56.9	59.2	48.2	55.7	62.7
08-25-95	54.3	56.6	58.8	46.1	54.2	63.5
08-26-95	55.1	56.9	59.2	48.2	56.2	66.0
08-27-95	54.7	56.6	58.8	47.2	55.6	62.7
08-28-95	54.7	56.8	58.8	48.6	55.7	62.2
08-29-95	55.9	56.7	57.5	53.1	56.0	57.9
08-30-95	54.3	56.2	58.3	47.9	53.7	59.2
08-31-95	53.9	56.2	58.8	47.5	54.2	62.7
09-01-95	54.7	56.8	59.2	48.2	55.8	65.5
09-02-95	55.1	57.4	60.0	50.1	57.2	67.4
09-03-95	55.5	57.5	60.0	50.4	57.8	65.5
09-04-95	56.3	58.4	60.5	54.7	60.5	70.0
09-05-95	57.5	58.8	60.0	54.7	60.1	62.4
09-06-95	55.9	57.6	59.6	49.7	56.2	63.2
09-07-95	56.3	57.7	59.6	53.5	58.3	64.1
09-08-95	55.5	57.5	59.6	49.7	56.6	62.2
09-09-95	55.5	57.6	59.6	49.3	56.7	64.5
09-10-95	55.9	57.9	60.0	50.1	57.6	66.0
09-11-95	56.7	58.5	60.5	52.3	59.3	67.4
09-12-95	56.7	58.4	60.0	50.8	58.6	66.9
09-13-95	55.9	58.0	60.0	51.2	58.1	66.9
09-14-95	56.3	58.0	60.0	51.2	57.8	66.4
09-15-95	55.9	58.0	60.0	49.7	58.0	67.9
09-16-95	56.3	58.0	59.6	52.7	58.5	66.4
09-17-95	55.5	57.5	59.2	50.1	57.1	66.0
09-18-95	56.3	57.7	59.2	51.9	58.1	65.0
09-19-95	56.7	57.4	58.3	52.7	57.3	63.5
09-20-95	55.5	56.3	57.5	49.0	53.7	60.9
09-21-95	52.7	54.6	56.3	38.5	49.1	57.5
09-22-95	52.3	54.3	56.7	38.5	48.3	57.1
09-23-95	52.3	54.1	56.3	41.1	49.8	60.0
09-24-95	51.9	53.6	55.5	41.7	50.0	59.6
09-25-95	51.6	53.5	55.5	43.4	50.3	59.6
09-26-95	52.3	53.2	53.9	45.8	50.2	52.7
09-27-95	52.3	53.0	53.9	46.8	50.0	52.3
09-28-95	53.1	53.5	54.3	50.4	52.1	53.9
09-29-95	52.7	53.3	54.3	49.3	51.4	54.3
09-30-95	51.9	52.9	53.5	45.4	49.9	52.3
10-01-95	50.4	51.5	52.7	37.6	44.5	49.0
10-02-95	50.1	50.7	51.2	41.1	44.3	46.6
10-03-95	50.1	50.7	51.6	44.1	46.5	48.2

Sullivan Creek Air & Water Temperatures at Powerhouse

<u>Date</u>	Water <u>Min</u>	Water <u>Avg</u>	Water <u>Max</u>	Air <u>Min</u>	Air <u>Avg</u>	Air <u>Max</u>
10-04-95	49.3	50.1	50.8	42.4	45.2	49.0
10-05-95	48.2	49.3	50.4	36.3	42.9	48.6
10-06-95	49.0	49.6	50.8	41.7	45.0	49.3
10-07-95	48.6	49.3	50.1	42.7	45.2	48.0
10-08-95	48.6	49.2	50.1	42.7	45.0	47.5
10-09-95	48.2	49.2	50.4	42.4	45.4	48.0
10-10-95	49.7	50.4	51.2	45.8	47.4	49.0
10-11-95	50.8	50.9	51.2	44.4	47.6	48.7
10-12-95	49.7	50.3	50.8	40.7	44.1	47.3
10-13-95	49.3	49.8	50.1	39.5	42.6	45.2
10-14-95	49.3	49.6	50.1	40.7	42.9	45.2
10-15-95	49.3	49.9	50.8	41.1	44.5	49.7
10-16-95	50.1	50.7	51.6	45.8	47.9	51.6
10-17-95	50.1	50.4	50.8	43.7	45.3	46.6
11-18-95	43.7	44.0	44.1	37.3	41.6	43.9
11-19-95	42.7	43.2	43.7	34.1	36.6	39.0
11-20-95	42.1	42.2	42.7	30.1	32.6	35.7
11-21-95	41.7	41.9	42.1	32.5	35.1	36.2
11-22-95	42.1	42.3	42.4	35.7	36.8	37.3
11-23-95	42.4	42.6	42.7	37.3	39.1	41.4
11-24-95	42.7	42.9	43.0	40.8	42.2	43.3
11-25-95	42.7	43.0	43.0	39.6	42.0	42.6
11-26-95	42.4	42.6	42.7	37.9	39.3	40.2
11-27-95	41.7	42.1	42.4	36.2	37.7	38.4
11-28-95	41.4	41.5	41.7	37.3	37.7	37.9
11-29-95	41.4	41.8	42.1	37.9	40.6	43.9
11-30-95	41.7	42.1	42.1	39.6	41.4	43.3
12-01-95	41.4	42.0	42.1	35.1	40.3	42.0
12-02-95	40.4	41.1	41.4	33.6	36.0	37.9
12-03-95	40.1	40.2	40.4	33.0	35.0	36.2
12-04-95	39.5	39.7	40.1	31.1	33.1	36.2
12-05-95	38.2	38.9	39.5	22.3	28.1	31.6
12-06-95	38.2	38.3	38.5	21.1	28.1	30.6
12-07-95	36.9	37.8	38.2	16.9	25.6	30.1
12-08-95	36.3	36.7	36.9	9.2	15.4	23.5
12-09-95	36.0	36.5	36.9	10.8	19.4	24.3
12-10-95	36.3	36.6	36.9	24.7	26.7	28.7
12-11-95	35.7	37.1	37.6	28.7	30.3	31.6
12-12-95	37.2	37.5	37.6	31.6	32.5	33.6
12-13-95	37.6	37.8	38.2	32.5	33.0	33.6
12-14-95	38.2	38.4	38.8	33.0	33.5	33.6
12-15-95	38.5	38.8	38.8	33.0	33.6	34.1
12-16-95	38.8	38.8	38.8	33.6	33.9	34.1
12-17-95	38.2	38.4	38.8	31.6	32.5	34.1
12-18-95	38.2	38.3	38.5	32.5	33.3	34.1
12-19-95	38.5	38.5	38.5	33.6	33.9	34.1
12-20-95	38.2	38.5	38.8	33.0	33.8	34.1
12-21-95	37.9	38.1	38.5	31.6	32.8	34.1
12-22-95	36.6	37.2	37.9	25.6	29.8	32.0
12-23-95	35.7	36.2	36.9	23.9	26.6	29.6
12-24-95	35.1	35.3	36.0	21.1	22.8	28.2
12-25-95	34.5	34.9	35.4	18.4	22.2	26.0
12-26-95	34.2	34.7	35.1	17.7	20.8	24.7
12-27-95	34.8	34.9	35.1	22.7	24.9	27.3
12-28-95	34.8	35.1	35.4	27.8	28.5	30.1
12-29-95	35.1	35.4	35.7	30.1	30.4	31.6
12-30-95	35.4	35.7	36.0	31.6	31.7	32.0
12-31-95	35.7	35.9	36.0	31.1	31.8	32.0
01-01-96	35.7	36.0	36.3	31.1	31.6	32.0
01-02-96	36.3	36.4	36.9	32.0	32.2	33.0
01-03-96	35.4	36.1	36.9	26.0	30.5	32.5
01-04-96	33.3	34.3	35.4	12.4	19.1	27.8
01-05-96	33.6	34.1	34.8	16.2	22.1	25.2
01-06-96	33.3	34.5	35.1	25.2	27.4	29.6
01-07-96	34.8	35.3	35.7	29.6	30.8	32.0

Sullivan Creek Air & Water Temperatures at Powerhouse

<u>Date</u>	Water Min	Water Avg	Water Max	Air Min	Air Avg	Air Max
01-08-96	35.4	35.6	36.0	32.0	32.1	32.5
01-09-96	35.4	35.7	36.0	32.0	32.0	32.0
01-10-96	35.7	35.9	36.0	32.0	32.3	33.0
01-11-96	35.4	35.7	36.3	28.7	31.6	33.0
01-12-96	35.1	35.6	36.0	29.2	31.0	31.6
01-13-96	35.7	36.0	36.0	31.6	32.0	33.0
01-14-96	36.0	36.2	36.6	32.5	32.9	34.6
01-15-96	36.3	36.4	36.9	33.0	33.4	34.6
01-16-96	34.5	35.6	36.9	23.5	28.6	33.0
01-17-96	32.7	33.7	34.8	12.7	19.6	28.7
01-18-96	33.9	34.1	34.2	21.5	22.7	24.7
01-19-96	33.6	34.1	34.5	21.5	25.2	26.5
01-20-96	33.3	34.1	34.5	25.2	27.0	27.8
01-21-96	33.6	33.9	34.5	23.9	26.4	27.8
01-22-96	33.6	33.7	34.2	26.5	27.1	27.8
01-23-96	33.6	34.0	34.5	24.7	27.7	28.7
01-24-96	33.0	33.7	34.2	19.5	26.4	28.2
01-25-96	33.3	33.5	33.9	22.3	25.0	26.9
01-26-96	32.7	33.0	33.6	17.3	20.8	25.2
01-27-96	32.7	33.1	33.6	20.7	23.7	25.6
01-28-96	32.1	32.3	33.0	0.9	12.5	23.1
01-29-96	32.1	32.1	32.1	-5.3	3.9	16.2
01-30-96	32.1	32.1	32.1	-0.5	6.3	11.7
01-31-96	32.1	32.1	32.1	-1.0	6.0	12.4
02-01-96	32.1	32.1	32.1	3.4	7.8	12.1
02-02-96	32.1	32.1	32.1	2.3	7.1	12.1
02-03-96	32.1	32.1	32.1	11.1	15.3	18.8
02-04-96	32.1	32.1	32.1	19.1	21.6	24.7
02-05-96	32.1	32.1	32.1	26.5	30.7	32.0
02-06-96	32.1	32.1	32.1	30.6	31.4	32.0
02-07-96	31.8	32.2	32.7	32.0	32.0	32.0
02-08-96	33.0	33.4	33.6	32.0	32.5	33.0
02-09-96	32.7	33.1	33.6	21.5	27.1	32.0
02-10-96	32.4	32.9	33.6	19.1	25.0	28.7
02-11-96	32.7	33.2	33.9	24.3	26.3	28.2
02-12-96	33.6	33.7	34.2	27.3	29.1	31.1
02-13-96	33.6	34.0	34.5	27.3	29.6	32.0
02-14-96	33.6	34.1	34.5	26.9	29.4	32.0
02-15-96	33.9	34.3	34.8	27.8	29.7	32.0
02-16-96	34.5	34.8	35.4	30.1	31.1	32.0
02-17-96	35.1	35.2	35.7	31.6	32.2	33.6
02-18-96	35.1	35.5	36.0	32.0	32.7	34.1
02-19-96	35.4	35.8	36.3	32.0	32.6	33.6
02-20-96	35.7	36.0	36.3	32.5	32.9	34.1
02-21-96	35.7	36.0	36.3	31.6	32.4	33.6
02-22-96	35.4	35.9	36.3	31.6	32.0	32.0
02-23-96	35.1	35.7	36.3	25.6	30.3	32.0
02-24-96	34.2	35.1	36.0	19.5	25.6	31.6
02-25-96	33.0	34.0	35.1	14.4	20.3	26.9
02-26-96	33.0	33.8	34.5	13.8	20.3	25.6
02-27-96	32.4	33.2	34.2	12.1	19.9	23.5
02-28-96	32.7	33.4	34.2	14.1	20.2	25.2
02-29-96	33.0	33.7	34.2	18.8	23.3	27.8
03-01-96	33.3	33.9	34.5	22.3	25.9	31.6
03-02-96	33.9	34.3	35.1	26.0	28.7	33.0
03-03-96	34.2	34.7	35.4	27.8	29.7	30.6
03-04-96	33.9	34.4	34.8	24.3	27.0	30.1
03-05-96	34.2	34.4	34.8	26.5	28.1	30.1

APPENDIX B
TEMPEST MODEL CALIBRATION DETAIL

July 24, 1994 tempest model results

calibration detail: 79 cfs, air temp profile = 724.txt, input=724cal.txt, starting water temp @ midnight
TEMPEST2 model results

		air temp			predicted water temp			actual water temp		
	cfs	gwinflow	max	min	mean	max	min	mean	max	min
pow	79	0.000010	26.80	17.30	21.30	19.65	17.21	18.41	19.70	17.10
pow	55	0.000010	26.80	17.30	21.30	19.84	17.03	18.41		
pow	27	0.000010	26.80	17.30	21.30	20.31	16.62	18.41		

		air temp			predicted water temp			actual water temp		
	cfs	gwinflow	max	min	mean	max	min	mean	max	min
pow	79	0.004000	26.80	17.30	21.30	19.62	17.15	18.35	19.70	17.10
pow	55	0.004000	26.80	17.30	21.30	19.79	16.96	18.35		
pow	27	0.004000	26.80	17.30	21.30	20.18	16.53	18.33		

		air temp			predicted water temp			actual water temp		
	cfs	gwinflow	max	min	mean	max	min	mean	max	min
pow	79	0.000010	80.2	63.1	70.3	67.4	63.0	65.1	67.5	62.8
pow	55	0.000010	80.2	63.1	70.3	67.7	62.7	65.1		
pow	27	0.000010	80.2	63.1	70.3	68.6	61.9	65.1		

		air temp			predicted water temp			actual water temp		
	cfs	gwinflow	max	min	mean	max	min	mean	max	min
pow	79	0.004000	80.2	63.1	70.3	67.3	62.9	65.0	67.5	62.8
pow	55	0.004000	80.2	63.1	70.3	67.6	62.5	65.0		
pow	27	0.004000	80.2	63.1	70.3	68.3	61.8	65.0		

		air temp			predicted water temp			
	cfs	gwinflow	max	min	mean	max	min	
Blw Mil	75	0.004	26.10	17.60	21.37	20.16	15.84	18.02
Blw Mil	50	0.004	26.10	17.60	21.37	20.41	15.55	18.00
Blw Mil	25	0.004	26.10	17.60	21.37	20.83	15.03	17.95

		air temp			predicted water temp			
	cfs	gwinflow	max	min	mean	max	min	
Blw Mil	75	0.004	78.98	63.68	70.47	68.29	60.51	64.44
Blw Mil	50	0.004	78.98	63.68	70.47	68.74	59.99	64.40
Blw Mil	25	0.004	78.98	63.68	70.47	69.49	59.05	64.31

		air temp			predicted water temp			
	cfs	gwinflow	max	min	mean	max	min	
T4SS2	75	0.004	26.10	17.60	21.37	20.69	15.21	17.97
T4SS2	50	0.004	26.10	17.60	21.37	20.88	14.97	17.94
T4SS2	25	0.004	26.10	17.60	21.37	21.06	14.73	17.91

		air temp			predicted water temp			
	cfs	gwinflow	max	min	mean	max	min	
T4SS2	75	0.004	78.98	63.68	70.47	69.24	59.38	64.35
T4SS2	50	0.004	78.98	63.68	70.47	69.58	58.95	64.29
T4SS2	25	0.004	78.98	63.68	70.47	69.91	58.51	64.24

calibration data for sullivan creek

	Predicted	Measur
0	21.40	17.43
1	20.80	17.30
2	20.20	17.17
3	19.40	17.04
4	18.90	16.90
5	18.60	16.77
6	18.10	16.66
7	17.80	16.62
8	17.60	16.67
9	17.80	16.79
10	18.10	16.96
11	18.90	17.16
12	19.90	17.38
13	21.40	17.60
14	22.90	17.80
15	24.40	17.97
16	25.80	18.08
17	26.10	18.11
18	26.10	18.05
19	25.40	17.97
20	24.40	17.88
21	23.80	17.78
22	22.90	17.67
23	22.30	17.55

Sept 18, 1994 tempest model results

calibration detail: 52cfs air temp profile = 818.txt, input = 918cal.txt, start wat=14.2
tempst2 model results

	cfs	gwinflow	air temp			predicted water temp			actual water temp		
			max	min	mean	max	min	mean	max	min	mean
pow	79	0.003	17.80	10.40	13.60	14.81	13.47	14.16			
pow	52	0.003	17.80	10.40	13.60	14.91	13.36	14.16	14.90	13.10	13.95
pow	27	0.003	17.80	10.40	13.60	15.14	13.11	14.16			
T4SS2	75	0.003	17.80	10.40	13.60	15.84	12.38	14.17			
T4SS2	50	0.003	17.80	10.40	13.60	16.10	12.17	14.18			
T4SS2	25	0.003	17.80	10.40	13.60	16.44	11.88	14.20			

Sept 18 calibrated model result

	Predicted	Measured	
0	13.50	14.17	14.20
1	13.10	14.04	14.20
2	12.60	13.90	13.90
3	11.90	13.77	13.70
4	11.50	13.63	13.70
5	11.10	13.50	13.50
6	10.70	13.36	13.50
7	10.40	13.38	13.30
8	10.40	13.46	13.10
9	10.90	13.59	13.10
10	11.30	13.76	13.10
11	11.90	13.96	13.10
12	12.80	14.16	13.30
13	13.90	14.36	13.70
14	15.60	14.56	13.90
15	17.10	14.73	14.40
16	17.80	14.85	14.60
17	17.80	14.91	14.90
18	17.10	14.89	14.90
19	16.30	14.86	14.90
20	15.60	14.72	14.60
21	15.10	14.59	14.60
22	14.40	14.45	14.40
23	13.70	14.31	14.20

APPENDIX C
WATER TEMPERATURE MODELING FOR SEPTEMBER

TEMPERATURE MODELING FOR SEPTEMBER

The agencies requested temperature modeling for September; the onset for spawning of brown trout and, if present, bull trout. Concern had been raised that reduced instream flows could potentially elevate stream temperatures and thereby delay spawning.

The same methods for modeling stream temperatures in July and August were applied for modeling of September water temperatures. Air and water temperature data were available for the project diversion reach for September 1993 and 1994. Daily temperature data are reported in Appendix A. The hottest water temperatures at the powerhouse with a complete 24 hour continuous record were recorded on September 18, 1994 (58.8°F). This date corresponded with unseasonably warm air temperatures. Modeling for September water temperatures used this date for model calibration. Cooler days would show less change in water temperature with reduced flow. The stream flow on September 18, 1994 was 52 cfs at the powerhouse.

Calibration input data are reported in Appendix B. The calibrated hourly temperature regime is compared to measured temperatures in Figure 1. Model calibration results are presented in Table 1.

**TABLE 1
CALIBRATED MODEL RESULTS: SEPTEMBER**

		Hourly Water Temperature °F		
		Maximum	Minimum	Mean
9/18/94	Predicted	58.8	56.0	57.5
	Measured	58.8	55.6	57.1
	Difference	0	0.4	0.4

The calibrated model was used to predict daily water temperature regimes at normal stream flows with and without project operation. Predicted water temperature regimes for the diversion reach during September (hottest days) are reported in Table 2.

TABLE 2
Predicted Daily Water Temperatures for September (Hottest Days)

	Discharge (cfs)	Maximum (°F)	Minimu m (°F)	Mean (°F)
Upstream of powerhouse	79	58.7	56.2	57.5
	52	58.8	56.0	57.5
	27	59.3	55.6	57.5
IFIM SS2 T4 wide riffle most temperature sensitive	75	60.5	54.3	57.5
	50	61.0	53.9	57.5
	25	61.6	53.4	57.6

Predicted water temperatures during current, pre-project stream flows (50 cfs) exceed the maximum temperature standard for Class AA streams ($16.0^{\circ}\text{C} = 60.8^{\circ}\text{F}$) in the vicinity of Study Site 2 transect 4 (a wide riffle near the North Fork Campground). Water quality standards are not naturally exceeded at any of the modeled stream reaches when stream flows are higher (75/79 cfs: below Mill Pond/at powerhouse). A reduction in stream flow of 25 cfs causes a corresponding increase in predicted water temperature up to but not exceeding 0.6°F. Predicted water temperatures are highest in shallow stream areas typified by Study Site 2 Transect 4. Exceptionally warm conditions were modeled for September. Most days would have cooler water temperatures with less of a response in stream temperature elevation caused by reductions in stream flow within the Sullivan Creek diversion reach.